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Guidance for the Reregistration of Pesticide Products Containing Copper Compounds/II as the Active Ingredient

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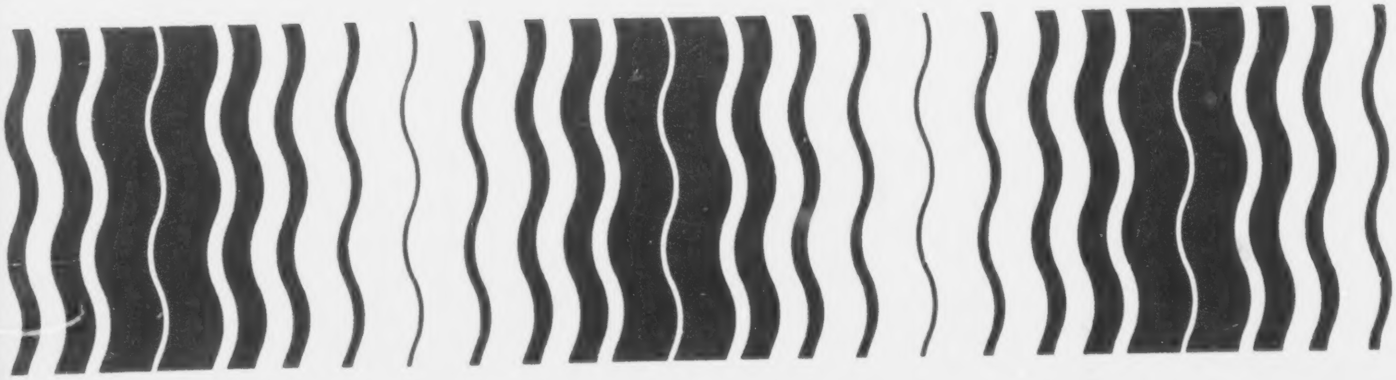
Guidance for the Reregistration of Pesticide Products Containing Group II Copper Compounds as the Active Ingredient



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GUIDANCE FOR THE REREGISTRATION OF PESTICIDE PRODUCTS

CONTAINING

GROUP II COPPER COMPOUNDS

AS THE ACTIVE INGREDIENT

CASE NUMBER 0649

April 1987

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDE PROGRAMS
WASHINGTON, D.C. 20460

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GLOSSARY/ACRONYMS

1. The Agency: U.S Environmental Protection Agency/EPA
2. A.I.: Active ingredient
3. DCI: Data Call-In Notice
4. EPs: End-Use pesticide products
5. EUP: Experimental Use Permit
6. FIFRA: Federal Insecticide, Fungicide, Rodenticide Act (As amended)
7. MPs: Manufacturing-Use pesticide products
8. NPDES Permit: National Pollutant Discharge Elimination System permit
9. OES: Office of Endangered Species, U.S. Dept. of the Interior
10. RAC's: Raw agricultural commodities
11. 40 CFR: Title 40, Code of Federal Regulations
12. Ion: An atom/group of atoms that carries a positive or negative electrical charge as a result of having gained or lost one or more electrons.

I. INTRODUCTION

The Registration Standards Program

EPA has established the Registration Standards program in order to provide an orderly mechanism by which pesticide products containing the same active ingredient can be reviewed and standards set for compliance with FIFRA. The standards are applicable to reregistration and future applications for registration of products containing the same active ingredient. Each registrant of a product containing an active ingredient subject to this Standard who wishes to continue to sell or distribute that product must bring his product and labeling into compliance with FIFRA, as instructed by this Standard. Pesticides have been grouped into use clusters and will be reviewed on the basis of a ranking scheme giving higher priority to (1) pesticides in clusters used on food and feed crops; and (2) pesticides produced in large volumes.

The Registration Standards program involves a thorough review of the scientific data base underlying a pesticide's registration. The purpose of the Agency's review is to reassess the potential hazards arising from the currently registered uses of the pesticide; to determine the need for additional data on health and environmental effects; and to determine whether the pesticide meets the "no unreasonable adverse effects" criteria of FIFRA. In its review EPA identifies:

1. Studies that are acceptable to support the data requirements for the currently registered uses of the pesticide.

2. Additional studies necessary to support continued registration. The additional studies may not have been required when the product was initially registered or may be needed to replace studies that are now considered inadequate.

3. Labeling revisions needed to ensure that the product is not misbranded and that the labeling is adequate to protect man and the environment.

The detailed scientific review, which is not contained in this document, but is available upon request[1], focuses on the pesticide active ingredient. The scientific review primarily discusses the Agency's evaluation of and conclusions from available data in its files pertaining to the pesticide active ingredient. However, during the review of these data the Agency is also looking for potential hazards that may be associated with the end use products that contain the active ingredient. The Agency will apply the provisions of this Registration Standard to end use products if necessary to protect man and the environment.

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[1] The scientific reviews may be requested from: Information Services Section (TS-768C), Office of Pesticide Programs, U.S. Environmental Protection Agency, Room 236, Crystal Mall #2, 1921 Jefferson Davis Highway, Arlington, Virginia 22202 (telephone (703) 557-4453). In addition, reviews may be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161, approximately 90 days after issuance of a Standard.

EPA's reassessment results in the development of a regulatory position, contained in this Registration Standard, on the pesticide and each of its registered uses. See Section IV - Regulatory Position and Rationale. Based on its regulatory position, the Agency may prescribe a variety of steps to be taken by registrants to maintain their registrations in compliance with FIFRA. These steps may include:

1. Submission of data in support of product registration;

2. Modification of product labels;

3. Modifications to the manufacturing process of the pesticide to reduce the levels of impurities or contaminants;

4. Restriction of the use of the pesticide to certified applicators or other specially trained individuals;

5. Modification of uses or formulation types; or

6. Specification of packaging limitations.

Failure to comply with these requirements may result in the issuance of a Notice of Intent to Cancel or a Notice of Intent to Suspend (in the case of failure to submit data).

In addition, in cases in which hazards to man or the environment are identified, the Agency may initiate a special review of the pesticide in accordance with 40 CFR Part 154 to examine in depth the risks and benefits of use of the pesticide. If the Agency determines that the risks of the pesticide's use outweigh the benefits of use, the Agency may propose additional regulatory actions, such as cancellation of uses of the pesticide which have been determined to cause unreasonable adverse effects on the environment.

EPA has authority under the Data Call-In (DCI) provisions of FIFRA sec. 3(c)(2)(B) to require that registrants submit data to answer our questions regarding the chemical, toxicological, and environmental characteristics and fate of a pesticide. This Registration Standard lists the data EPA believes are necessary to resolve our concerns about this pesticide. These data are listed in Table A in Appendix I. Failure to comply with the DCI requirements enumerated in this Registration Standard may result in issuance by EPA of a Notice of Intent to Suspend the affected product registrations.

Registrants are reminded that FIFRA sec. 6(a)(2) requires them to submit factual information concerning possible unreasonable adverse effects of a pesticide at any time that they become aware of such information. You should notify the Agency of any information, including interim or preliminary results of studies, if those results suggest possible adverse effects on man or the environment. This requirement continues as long as your products are registered by the Agency.

II. CHEMICALS COVERED BY THIS STANDARD

A. Description of chemicals

The following compounds are covered by this Registration Standard. They are designated the Group II copper compounds since a previous Standard covered copper sulfate compounds.

Table 1. Identifying information for the Group II copper compounds.

Compound--[a]	Empirical Formula	Molecular Weight	CAS Registry No.	Shaughnessy No.
Copper ammonium carbonate (CAC)	--[b]	--[b]	33113-08-5	022703
Copper ammonium complex (CC)	--[c]	--[c]	16828-95-8	022702
Copper carbonate (CCB)	$CuCO_3.Cu(OH)_2$	221.11	12069-69-1	022901
Basic copper chloride (BCC)	--[d]	--[d]	--[d]	008001
Copper chloride dihydrate (CCD)	$CuCl_2.2H_2O$	170.48	10125-13-0	023701
Copper citrate (CCT)	$C_6H_4Cu_2O_7$	315.18	10402-15-0	044005
Copper hydroxide (CH)	$Cu(OH)_2$	97.56	20427-59-2	023401
Copper nitrate (CN)	$Cu(NO_3)_2$	187.56	3251-23-8	076102
Copper oxalate (CO)	CuC_2O_4	151.56	814-91-5	023305
Copper oxychloride (COC)	$ClCu_2H_3O_3$ --[e]	213.56	1332-40-7	023501
Copper oxychloride sulfate (COCS)	--[f]	--[c]	8012-69-9	023503

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[a] Copper compounds which are registered as pesticides and covered by this Standard.

[b] Unavailable.

[c] Indefinite.

[d] Could not be determined from available information. While Qualitative Use Assessment (19 November 1985) defines BCC as identical to COC, desk references indicate the two compounds are distinct, and give a formula of $CuCl_2.Cu(OH)_2$ and a molecular weight of 232.00 for BCC.

[e] Formula approximate (from desk references only). Exact formula of registered technical grade product was unavailable.

[f] Could not be determined from available information. Alternative formulae found include: (i) $[3Cu(OH)_2.CuCl_2 + 3Cu(OH)_2.CuSO_4]$ (from desk references); (ii) $[CuSO_4.Cu(OH)_2] + 8[CuCl_2.4Cu(OH)_2]$ (from MRID 00058009); and (iii) $[CuCl_2.2CuO.4H_2O] + [CuCl_2.3CuO.3.5H_2O] + [CuSO_4.2Cu(OH)_2]$(29:59.5:11.5;(Agency files).

Copper ammonium carbonate (CAC) is the common name for a bacteriocide and fungicide produced in the U.S. by Mineral Research and Development Corp. It is also known as Copper-Count-N.

Copper ammonium complex (CC) of indefinite composition is a fungicide produced in the U.S. by Kocide Chemical Corp. Other names for this substance include ammoniacal copper complex and K-Cop.

Copper carbonate (CCB) is the common name of a fungicide produced in Italy by Caffaro S.p.A., and in the U.S. by Tennessee Chemical Co., and the Leffingwell Division of Uniroyal Chemical. The chemical name for CCB is basic cupric carbonate; other names include copper carbonate hydroxide, cupric subcarbonate, Bremen blue, Bremen green, malachite, [carbonato (2)-dihydroxy]dicopper, and Nutra-Spray Basic Copper Carbonate.

The nature of the compound basic copper chloride (BCC) is unclear from available information. BCC is considered synonymous with copper oxychloride (see below) by some sources, but is considered a distinct compound by others (see Table 1). No alternate names or manufacturer data were available for BCC as of this writing.

Copper chloride dihydrate (CCD) is the common name for a fungicidal compound for which no manufacturer data or alternate names were available as of this writing.

Copper citrate (CCT) is the common name of an algicide and bacteriocide. The chemical name for CCT is 2-hydroxyl-2,3-propanetricarboxylic acid copper salt (1:2). Alternate names are cupric citrate and Cuprocitrol. As of this writing, no manufacturer data were available for this material.

Copper hydroxide (CH) is the common name for a fungicide produced in Italy by Caffaro S.p.A, in France by La Cornuloia S.A., in Great Britian by McKechnie Chemicals, Ltd., and in the U.S. by Kocide Chemical Corp., and by Crystal Chemical Inter-America. The chemical name for CH is cupric hydroxide; other names include Comac Parasol, Criscobre, Cudrox, Cuidrox, and Kocide.

Copper nitrate (CN) is the common name for a fungicide. The chemical name for CN is cupric nitrate; alternate names and manufacturer information were not available as of this writing.

Copper oxalate (CO), chemical name cupric oxalate, is a crow repellent. Another name for CO is Crow-Chex. No manufacturer information was available as of this writing.

Copper oxychloride (COC) is the common name for a fungicide manufactured in West Germany by BASF AG, in Italy by Caffaro S.p.A., in France by Rhone-Poulenc Agrochimie, and in Switzerland by Sandoz, Ltd. The chemical name for this compound is reported (Farm Chemicals Handbook, 1986, p. C. 28) to be basic cupric chloride; however, the empirical formula for COC differs from that available for BCC (see Table 1). Other names for COC include atacamite, BASF-Grunkupfer, basic copper chloride (but see above), Blitox Chempar, Cobox, Colloidox, Coprantol, CopTox, Coxysan, Cu56, Cuidrox, Cudrox, Cupramar, Cupravit, Cuprocaffaro, Cuprokylt, Cuprosana, Cuprovinol, Cuprox, Devicopper, Fytolan, Kauritil, Kilex, Pasta Caffaro, Recop, Rhodiacuivre, Viricuivre, and Vitigran.

Copper oxychloride sulfate (COCS) is the common name for a fungicide manufactured in the U.S. by C.P. Chemicals, Inc., and by Los Angeles Chemical Co. Other names for COCS include Copro 53, Capro 57, CS-56, and Coxysul.

B. Use Profile

Copper ammonium carbonate (CAC) is a fungicide federally registered for use on field, bush, vine, and vegetable crops, and deciduous fruit and nut trees. CAC formulations registered for use on food/feed crops include 8% and 10% soluble concentrates/liquids (SC/Ls) and 8% flowable concentrates (FlCs). These formulations are applied as dormant, delayed dormant, and/or foliar treatments by aerial or ground equipment.

Copper ammonium complex (CC) is a fungicide federally registered for use on field, bush, vine, and vegetable crops, deciduous nut trees, ornamental plants and forest trees, and for treatment of wood products. CC formulations registered for use on food/feed crops include 0.8% and 8% soluble concentrate/liquids (SC/Ls). These formulations are applied as foliar treatment by ground or aerial equipment.

Copper carbonate (CCB) is a fungicide federally registered for use on field, bush, vine and vegetable crops, citrus, and deciduous fruit and nut trees. CCB formulations registered for use on food/feed products include: 20% and 55% dust (D), used for seed treatment of sorghum and wheat; a 1.3% impregnated paper for wrapping pear fruits after harvest; and a 51% wettable powder (WP) applied to various crops as a dormant, delayed dormant, soil, and foliar treatment by ground equipment.

Basic copper chloride (BCC) is a fungicide for which no end-use products have been identified.

Copper chloride dihydrate (CCD) is a fungicide which is not presently registered for food uses. Use is limited to treatment of soil for ornamental bulbs and the planting medium for orchids. It is formulated as a one percent emulsifible or 2.7% liquid concentrate.

Copper citrate (CCT) is an algicide and antimicrobial compound for cooling water systems, applied as an 11.24% liquid. There are no federal product registrations at present. There is an intrastate registration for use in California.

Copper hydroxide (CH) is a fungicide, herbicide, and marine antifoulant federally registered for use on field, bush, vine and vegetable crops, cereal grains, citrus fruits, deciduous fruit and nut trees, bananas, cocoa, coffee, mangoes, as well as ornamental plants and forest trees, and boat bottoms and hulls (as an antifoulant). CH formulations registered for use on food/feed crops include: D, WP, FlC and ready-to-use (RTU) liquids. CH formulations are applied to barley, rice and wheat seed, and as dormant, delayed dormant, and foliar treatments by ground or aerial equipment (ground only for grapes and hops). The Agency estimates that CH accounts for approximately 85% of the total Group II copper usage. The antifoulant use pattern is not being considered under this Standard.

Copper nitrate (CN) is a fungicide and antimicrobial used only in aquatic nonfood sites, such as cooling towers, paper mill systems and heat exchangers, applied as .04% and .6% RTU liquids.

Copper oxalate (CO) is a bird repellent federally registered for use on corn seed as a 4% dust.

Copper oxychloride (COC) is a fungicide federally registered for use on field, bush, vine, and vegetable crops, citrus fruits, and deciduous fruit trees. Additional COC uses include ornamental plants and greenhouse-grown peppers and tomatoes. COC formulations registered for use on food/feed crops include WPs, and a FlC. These are applied as delayed dormant, dormant, soil, or foliar treatments by aerial or ground equipment.

Copper oxychloride sulfate (COCS) is a fungicide federally registered for use on field, bush, vine and vegetable crops, citrus fruits, deciduous fruit and nut trees. Other COCS sites include tobacco, ornamental plants, white oak, and greenhouse-grown vegetable seedlings. COCS formulations registered for food/feed crop use include Ds, WPs, and a wettable powder/dust. These formulations are applied as dormant, delayed dormant, and foliar treatments by ground or aerial equipment (ground only for hops and vegetable seedlings in greenhouses and coldframes).

III. AGENCY ASSESSMENT

A. SUMMARY

The Group II copper compounds are used primarily as fungicides on a wide variety of food crops. However, four of the compounds are fungicides/algicides with no food uses (basic copper chloride, copper chloride dihydrate, copper citrate, and copper nitrate). Note that the copper ion is the entity responsible for fungicidal/ pesticidal actions in these copper compounds, both for food and non-food uses. (Copper oxalate is the only exception; it is used as a bird repellent for seed corn, acting through taste aversion). Application techniques vary widely from aerial application to various types of ground applications to impregnated paper which is wrapped around pears.

The Agency has reviewed all of the data submitted to support the registration of the Group II copper compounds, as well as open literature information relevant to these compounds. Based on the review of these data, the Agency has reached the following conclusions: 1) The only significant concern for potential risks posed by uses of Group II copper compounds is for toxicity to aquatic organisms, which may include endangered species; 2) the toxicity of copper ion is well understood, and additional data on chronic health effects is not required; 3) no significant risks to human health are likely to be posed by any of the registered uses of Group II pesticide compounds; 4) the existing exemptions from tolerance requirements for some of the Group II compounds are appropriate, and exemptions are also appropriate for the rest of the Group II compounds which have not been specifically exempted or have been subject to a tolerance requirement in the past.

B. PRELIMINARY RISK ASSESSMENT

1. Ecological Effects

The primary issue associated with the registration of these chemicals involves their toxicity to aquatic organisms. The Agency has relevant data on some Group II compounds, and also considered data on the aquatic toxicity of copper sulfates, since these data also indicate the aquatic effects of copper ion.

According to the available data, some copper compounds are highly toxic to some species of fish and aquatic invertebrates. For example, the lethal concentrations (LC_{50}s) for fish range from 22 parts per billion (ppb) of copper sulfates for (fathead minnow) to greater than 180 parts per million (ppm) of copper oxychlorides for (bluegill).

Chronically, copper compounds are expected to affect some fish species (brook trout) at levels between 3 and 5 ppb. Acute toxicity to aquatic invertebrates is also very high with LC_{50}s ranging from 6.5 ppb to 200 ppb for (Daphnia magna). Chronic effects on aquatic invertebrates are expected at levels ranging from 6 ppb for (Gammarus pseudolimnaeus) to 58 ppb for (mysid shrimp).

Using theoretical calculations and models, the Agency estimates that terrestrial applications may result in aquatic concentrations in excess of aquatic LC_{50}'s and thus produce hazardous conditions for some aquatic organisms. Additional data are required in order to determine whether terrestrial applications are likely to raise aquatic concentrations to hazardous levels. Through this Registration Standard, the Agency is requiring that registrants produce information regarding the availability of dissolved copper ions in aquatic systems. Once this information is available, the hazards to aquatic organisms can be adequately evaluated.

2. Endangered Species

Copper compounds are not expected to have acute toxic effects on terrestrial organisms. For example, data on acute toxicity to avian species shows that copper compounds are practically non-toxic in the diet (LC_{50} >10,000 ppm copper sulfate for mallard ducks and bobwhite quail), and moderately toxic in a single dose (LD_{50} 340 to 420 mg/kg copper sulfate for bobwhite quail).

However, there may be some potential for chronic effects on endangered birds, since the use patterns for some of the Group II copper compounds involve frequent application to certain fruit and field crops which could result in chronic exposure of avian species. Thus, avian reproduction studies will be needed to evaluate the potential for chronic effects. In addition, the use of these compounds may result in potentially hazardous exposure to endangered aquatic species. The Agency has developed labeling precautions for endangered species that will be required if the U.S. Fish and Wildlife Service (USFWS) concurs. If data on ecological effects, required by this Standard, indicates additional hazards to endangered species, the Agency will initiate consultation with the USFWS on appropriate measures to mitigate these hazards.

C. OTHER SCIENCE FINDINGS

The role of copper as an essential nutrient for plant and animal life has been known for decades. Consequently, explanations of the metabolism and biological role of copper in living organisms are readily available in the basic literature of biochemistry as well as plant, animal and human physiology, and specific literature citations are not given in this Standard for information derived from such sources. The points summarized under items 1, 2, 3, and 4 below are drawn primarily from open sources including textbooks on these subjects.

1. Available information, primarily from open literature sources, indicates that these compounds do not present risks of chronic or subchronic adverse health effects.

   a. The copper ion in the Group II copper compounds is not only a recognized pesticide, but it is also a trace element essential for growth and well-being of higher plants and animals, including man. Copper is ubiquitous in nature, and occurs in virtually all soils, as well as plant and animal tissues.

   b. Man has a natural, efficient homeostatic mechanism for regulating the body levels of copper ions over a wide range of dietary intake. This mechanism integrates the absorption, retention and excretion of copper to stabilize the body burden. Only a small percentage of ingested copper is absorbed, and most of the absorbed copper is excreted. The adult human body burden of copper is typically 80 - 150 mg.

   c. There is no known evidence of chronic adverse human health effects from dietary exposure, and none would be expected except in case of massive intake disrupting the natural homeostatic mechanism controlling body levels of copper. Industrial hygiene literature indicates that long term occupational exposure, such as copper mining, is not associated with adverse chronic effects.

2. Several natural factors also limit the availabilty of copper in growing plants, and consequently in raw agricultural commodities treated with Group II copper compounds.

   a. Physio-chemical properties of soils naturally modify copper ion availability and when soils are adjusted/limed to the pH required for normal crop production, the effect is to reduce copper ion availability to the crop.

b. Toxic copper levels in plants induce an imbalance with iron which causes plant dwarfing, stunted roots and decreased growth and yields. These effects appear before significant copper build-up occurs, and consequently act as a warning which prevents excess application of copper compounds to food/feed crops.

3. Available data do not indicate that these compounds leach into ground water supplies.

4. Available data indicate that most Group II compounds fall into Toxicity Category III for oral and dermal toxicity (except copper chloride dihydrate which is Category II for oral toxicity), and Category IV for dermal irritation. Based on data described in the bibliography, copper carbonate was found to be a Category III eye irritant; copper oxychloride sulfate was found to be a Category II eye irritant;and copper oxychloride and copper hydroxide were found to be Category I eye irritants. Copper is also considered to be a dermal sensitizer. Additional data are required to assess the acute toxicological characteristics of certain of the Group II copper compounds. Refer to Table A (Appendix I) for a description of data required.

D. TOLERANCE REASSESSMENT

1. A tolerance of 3 parts per million (ppm) on pears has been established for residues of combined copper resulting from post-harvest application of basic copper carbonate (in impregnated paper wrappers)(40 CFR 180.136). This is the only tolerance for a Group II copper compound.

   - The current 3 ppm tolerance does not appear to be necessary in terms of health protection; many untreated food commodities have higher levels of naturally occurring copper.

   - The toxicological and physio-chemical factors cited in Section C above support the view that any residues likely to result in pears from use of basic copper carbonate impregnated paper wrappers would not pose any significant risks to human health.

   - The Agency will revoke this tolerance and establish an exemption from tolerance requirements for use of copper compounds impregnated into wrapping paper for pears (see Part IV).

2. Several Group II copper compounds are exempt from tolerance requirements when applied to growing crops in accordance with good agricultural practices. These are copper carbonate, copper hydroxide and copper oxychloride (40 CFR 180.1001(b)(1)). Copper carbonate is also exempt from tolerance requirements for residues in meat, milk, poultry, eggs, fish, shellfish and irrigated crops resulting from use as an algicide (40 CFR 180.1021(b)). The Agency believes these exemptions are appropriate, given the lack of toxicological concern about low level dietary exposure to copper. In addition, exemptions are supported by several factors which limit the likelihood of exposure to excessive copper residues resulting from application of Group II copper compounds to growing plants.

   - Copper salts are expected to be washed off plants by rain and during processing;
   - Water soluble cupric ions are rapidly adsorbed and immobilized by organic matter in soil;
   - As noted above (C.2), high levels of copper visibly damage plants before toxicologically significant levels are reached, and most copper in soils is unavailable for uptake by growing plants.

3. There are several Group II copper compounds used on food/feed commodities for which tolerances or exemptions have not been established. These are copper ammonium carbonate, copper ammonium complex, copper oxalate, and copper oxychloride sulfate. The Agency will revise 40 CFR 180.1001(b)(1) to include these specific copper compounds along with the other copper compounds already exempted from tolerance requirements when applied to growing agricultural crops (see Part IV). Basic copper chloride, copper chloride dihydrate, copper citrate and copper nitrate have no food uses, and will not be exempted as part of this Agency action.

4. There are no Mexican tolerances, Codex Maximum Residue Levels, or exemptions for copper on food/feed commodities. Canada has established a tolerance of 50 ppm calculated as metallic copper to cover residues on all fresh fruits and vegetables resulting from application of copper compounds, including copper oxychloride, copper oxychloride sulfate and other copper sulfate compounds.

E. SUMMARY OF LABEL CHANGES AND DATA GAPS

The Agency has determined that label revisions must be made in the following areas (See Section D, Part IV).

- Environmental Hazards
- Protective Clothing

The Agency has identified data necessary to evaluate the environmental and human risks associated with the use of Group II copper compounds. These data must be developed in order to maintain registrations of products or register new products containing Group II copper compounds. The following table summarizes the data gaps, including product chemistry information. Please note that this is only a summary and details can be obtained by referring to Table A.

Summary of Data Gaps - Group II Copper Compounds

158.120 Product Chemistry:

61-2	Description of Beginning Materials and Manufacturing Process
61-3	Discussion of Formation of Impurities
62-1	Preliminary Analysis
62-2	Certification of Limits
62-3	Anal. Method of Enforcement
63-2 to 63-13	Color, Physical State, Odor, Boiling Point, Specific Gravity, Solubility, Vapor Pressure Dissociation Constant, Octanol/water partition coef., pH, and Stability

158.135 Toxicology:

81-1	Acute Oral Toxicity (Rat)
81-2	Acute Dermal Toxicity (Rabbit)
81-4	Eye Irritation Toxicity (Rabbit)
81-5	Dermal Irritation (Rabbit)

158.130 Environmental Fate

163-1	Mobility Studies
164-1,2	Dissipation Studies

158.145 Wildlife and Aquatic Organisms

70-1	Special Testing
71-4	Avian Reproduction Studies (Copper Hydroxide; Copper Oxychloride Sulfate)

IV. REGULATORY POSITION AND RATIONALE

A. Regulatory Positions

Based on a review and evaluation of all available data and other relevant information on the Group II copper compounds, the Agency has reached the determinations listed below.

1. The Agency has determined that most chronic toxicological studies normally required to support pesticide registrations need not be submitted in support of Group II copper compounds.

Rationale: The Agency does not have submitted data on Group II compounds which meet Agency guidelines for most health effects testing usually required to support pesticide registrations. However, the Agency has determined that the copper ion is the entity responsible for the biological actions of Group II compounds, and that adequate information to characterize the toxicity of the copper ion is available from literature sources. The available information shows that copper is ubiquitous in nature and is a necessary nutritional element for both animals and plants. It is one of 26 elements found essential to life. Copper (ion) is present in the adult human body at levels of 80-150 mg.

Oral ingestion of excessive amounts of copper (ion) from pesticidal uses is unlikely; copper compounds are irritating to the gastric mucosa and emesis usually occurs promptly, thereby reducing the amounts of copper (ion) available for absorption into the human body. Moreover, man is protected from excess copper (ion) in the body by an effective homeostatic mechanism which integrates absorption, retention and excretion to stabilize copper (ion) burden in the body. Only a small percentage of copper (ion) ingested is absorbed, and most of the absorbed copper is excreted.

In view of the fact that copper (ion) occurs naturally in most foods, and the metabolism of copper is well understood, as summarized above, there is no reason to expect that long term exposure to copper (ion) in the diet is likely to pose risks of chronic or sub-chronic adverse effects.

2. The Agency has determined that data must be submitted to characterize the acute oral toxicity of copper ammonium carbonate, copper ammonium complex and copper oxalate. Data must also be submitted to characterize the acute dermal toxicity and primary eye and skin irritation effects for all the Group II copper compounds except copper carbonate, copper hydroxide, copper oxychloride and copper oxychloride sulfate.

Rationale: The Agency does not have this acute toxicity data for the Group II compounds cited above. The Group II copper compounds for which the Agency does have data are only moderately toxic upon acute oral or dermal exposure (Toxicity Category III). Copper chloride dihydrate, however, is in Category II for acute oral toxicity. Ocular exposure to Group II compounds may cause moderate to severe eye irritation (Toxicity Category I, II, or III). Data for these types of acute effects are needed to ensure the proper labeling of the Group II compounds for which these data are not currently available.

3. The Agency has determined that certain precautionary statements for persons handling or applying Group II copper compounds are required on the labels of manufacturing-use and end-use products in order to minimize acute toxicity and skin sensitization. Labels of these products must contain statements that warn persons applying or handling the Group II copper compounds of potential effects, give first aid instructions, and require the use of precautionary measures such as protective clothing and goggles. The specific language of these statements is given in Section D of this Part.

Rationale: The Group II copper compounds can pose risks of acute effects, such as eye irritation. In addition, it is known that hypersensitivity or sensitization can result from the copper compounds' contact with the skin.

4. The Agency is not imposing a re-entry interval for workers after sprays have dried, for any of the Group II copper compounds.

Rationale: The toxicity of the Group II compounds does not warrant significant concern about exposure of workers reentering treated areas after sprays have dried, according to criteria in 40 CFR Part 158.140. Group II copper compounds have not been determined to be toxic via oral, dermal or inhalation exposure, and no chronic health concerns have been identified.

5. The Agency will require registrants to submit additional data needed to assess the effects of Group II copper compounds on nontarget species, particularly aquatic organisms. These requirements are specified in Table A of the Data Appendices of this guidance document.

Rationale: Existing studies on the Group II copper compounds indicate that they are toxic to certain fish species and other non-target aquatic organisms (invertebrates). Toxicity to terrestrial organisms is low; however, the potential for chronic effects on avian species resulting from certain use patterns for Group II copper compounds cannot be assessed without further data.

The limited data currently before the Agency are not adequate to determine whether these copper compounds, applied at recommended rates, actually present unreasonable hazards to fish and other non-target organisms. Thus, the Agency will require field dissipation studies, and monitoring for residues in the environment and adverse effects on wildlife to determine whether the use of specific Group II compounds results in unreasonable adverse effects.

6. The Agency has determined that additional label precautions for hazards to fish and other aquatic organisms are required to prevent unreasonable adverse effects on the environment. These label requirements are specified in Section D of this Part.

Rationale: Since the Group II compounds are toxic to aquatic organisms in laboratory studies, label precautions will mitigate the potential for adverse effects until a complete hazard evaluation based on adequate data is available.

7. The Agency has determined that labeling to mitigate potential hazards to endangered species will not be required through this Registration Standard.

Rationale: Labeling precautions for endangered species are being deferred until concurrence is obtained from the U.S. Fish and Wildlife Service. The Agency will notify registrants through a Pesticide Registration (PR) Notice, of the final labeling requirements for endangered species.

8. The Agency will revise 40 CFR 180.1001(b)(1) to add copper ammonium carbonate, copper ammonium complex, copper oxalate, and oxychloride sulfate to the list of copper compounds exempted by that regulation from tolerance requirements when applied to growing crops.

Rationale: The metabolism of copper in growing plants is well understood and documented in the available literature. The use of those Group II compounds not currently exempt from tolerance requirements would have essentially the same result in terms of contribution of copper (ion) to growing crops as the use of the Group II compounds already exempt under this section (copper carbonate, copper hydroxide and and copper oxychloride). The Agency believes there is adequate information to show that there is no toxicological concern raised by the contribution of copper (ion) to growing crops likely to result from application of Group II pesticide compounds, and consequently no tolerances are required for such uses.

9. The Agency will revoke the existing tolerance of 3 ppm combined copper on pears resulting from post-harvest use of copper carbonate (40 CFR 180.136). The Agency will establish an exemption from tolerance requirements for use of copper compounds in impregnated wrapper paper for post-harvest use on pears.

Rationale: Available information on both toxicity and the potential for dietary exposure to copper ion likely to result from pesticidal use of copper compounds on food commodities indicate that there is no need for the current tolerance in terms of health protection. No toxicologically significant exposure is likely to result from paper wrappers impregnated with any Group II copper compound; consequently this use should be exempt from tolerance requirements.

10. While the data gaps are being filled, currently registered MPs and EPs containing Group II copper compounds may be sold, distributed, formulated and used in the United States, subject to the terms and conditions specified in this Standard. Registrants must provide and agree to develop additional data, as specified in the Data Appendices of this guidance document, in order to maintain existing registrations.

Rationale: Under FIFRA, the Agency does not normally cancel or withhold registration simply because data are missing or inadequate (see FIFRA sec. 3(c)(2)(B) and 3(c)(7)).

Issuance of this Standard provides a mechanism for identifying data needs. These data will be evaluated, after which the Agency will determine if additional regulatory changes are necessary.

B. Criteria for Registration

To be covered under this Standard, manufacturing-use products must contain a Group II copper compound (copper ammonium carbonate, copper ammonium complex, copper carbonate, basic copper chloride, copper chloride dihydrate, copper citrate, copper hydroxide, copper nitrate, copper oxalate, copper oxychloride, or copper oxychloride sulfate) as the sole active ingredient, bear required labeling, and conform to the product composition, acute toxicity limits, and use pattern requirements listed in Section C below.

C. Acceptable Ranges and Limits

1. Product Composition Standard

To be covered under this Standard, manufacturing-use products (MPs) must contain Group II copper compounds as the sole active ingredient. Each MP formulation proposed for registration must be fully described with an appropriate certification of limits, stating maximum and minimum amounts of the active ingredient which may be present in products.

2. Acute Toxicity Limits

The Agency will consider registration of technical grade and MP products containing the Group II copper compounds, provided that the product labeling bears appropriate precautionary statements for the acute toxicity category in which each product is placed.

3. Use Patterns

To be registered under this Standard, manufacturing use products containing the Group II copper compounds may be labeled for formulation into end-use products only for the commodities listed below. The attached index entry lists all registered uses, as well as approved maximum application rates and frequencies.

- Terrestrial food uses on fruit, grain, nut and vegetable crops, and for grain seed treatment (including crow repellent treatment);

- Terrestrial, nonfood uses on forest trees, ornamentals, and tobacco;

- Greenhouse food use on vegetable seedlings;

- Aquatic impact food uses on rice and cranberries;

- Aquatic, nonfood uses on water systems (pulp and paper mill systems, cooling towers, spray ponds, and pole soaking treatments);

- Indoor use on wood products

D. Required Labeling

All manufacturing-use and end-use Group II copper compound products must bear appropriate labeling as specified in 40 CFR 162.10, PR Notice 83-3, and below. Appendix II contains information on label requirements.

No pesticide product containing Group II copper compounds may be released for shipment by a registrant or producer of that product after April 30, 1988, unless the product bears an Agency approved amended label which complies with the requirements of this Standard.

No pesticide product containing Group II copper compounds may be distributed, sold, offered for sale, held for sale, shipped, delivered for shipment, or received and (having been so received) delivered or offered to be delivered by any person after April 30, 1989, unless the product bears an Agency approved amended label which complies with the requirements of this Standard.

The following information must appear on the labeling within the time limits specified above:

1. Ingredient Statement

The ingredient statement for all manufacturing-use products containing Group II copper compounds must list the active ingredient in the following manner (examples):

"Copper oxychloride ....XX%";

"Copper chloride dihydrate ....XX%";

"Copper hydroxide ....XX%";

The ingredient statement must have a footnote reading:

"Metallic copper equivalent...................XX%"

2. Use Pattern Statements

All manufacturing-use products containing Group II copper compounds must state that they are intended for formulation into end-use products for the aforementioned use patterns. Labeling must specify sites which are listed in Section C.3. above under Use Patterns. However, no use may be included on the label if the registrant fails to comply with the data requirements for that use pattern, as listed in Table A of the Data Appendices of this document.

3. Precautionary Statements

a. Hazards to Humans and Domestic Animals (Manufacturing-Use)

Labels for manufacturing-use products (MPs) containing Group II copper compounds must bear statements reflecting the compound's acute human toxicity. These compounds are in Toxicity Category III for oral and dermal toxicity (except copper chloride dihydrate which is Toxicity Category II for oral effects)*; Category IV for dermal irritation; and Category I, II, or III for eye irritation.

The following human hazard statements must appear on all MP labels:

- Copper hydroxide and copper oxychloride - "DANGER. Corrosive. Causes irreversible eye damage." (and text below)

- Copper oxychloride sulfate - "WARNING. Causes substantial but temporary eye injury." (and text below)

- Copper carbonate - "CAUTION. Causes eye irritation." (and text below)

- Other Group II compounds - (Use existing signal word and eye precautions until test results are available [see Table A, footnotes 1/&2/], and text below)

- All MPs - "Harmful if swallowed, absorbed through the skin or inhaled. May cause skin sensitization reactions in certain individuals. Avoid contact with skin, eyes, or clothing. Avoid breathing dust. Protective clothing, including goggles, should be worn. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse."

b. Hazards to Humans and Domestic Animals (End-Use)

- All EPs - "May cause skin sensitization reactions in certain individuals."

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*There are no single-active manufacturing- or end-use products registered for pesticidal use as of March 1987.

- All EPs - (Cont.)

NOTE: The remainder of text from 40 CFR Section 162.10 should reflect toxicity characteristics of the particular Group II copper end-use formulation. Acute toxicity information on end-use formulations was not assessed in developing this Standard unless the end-use product was substantially similar to a manufacturing-use formulation.

c. Environmental Hazards (Manufacturing-Use)

"This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public water unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA."

d. Environmental Hazards (End-Use)

The following statements may be combined as appropriate where more than one site category applies:

- Aquatic non-crop uses -(pulp/paper mill systems, cooling towers, spray ponds, pole soaking)

"This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA."

- Terrestrial uses -

"This pesticide is toxic to fish and aquatic organisms. Do not apply directly to water. Drift and runoff from treated areas may be hazardous to fish and aquatic organisms in adjacent aquatic sites. Do not allow rinsate from cleaning of equipment or disposed material to enter surface or ground water." (NOTE: Drift and runoff statement may be deleted where it does not apply, e.g. grain seed treatment)

V. PRODUCTS SUBJECT TO THIS STANDARD

All products containing the pesticide identified in Section II.A. are subject to certain requirements for data submission or changes in composition, labeling or packaging of the product. The applicable requirements depend on whether the product is a manufacturing or end-use product.

Products are subject to this Registration Standard as follows:

A. Manufacturing-use products containing this pesticide are subject to: 1) The restrictions upon use, composition, or packaging listed in Section IV; 2) The data requirements listed in Table A; 3) The labeling requirements specified for manufacturing-use products in Section IV; 4) Administrative requirements (application forms, Confidential Statement of Formula, data compensation provisions) associated with reregistration.[1]

B. End-use products containing this pesticide are subject to: 1) The labeling requirements specified for end-use products in Section IV; 2) If not eligible for the formulator's exemption, the data requirements listed in Table A.[2]

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[1] Data requirements are listed in the Tables in Appendix I of this Registration Standard. The Guide to Tables in that Appendix explains how to read the Tables. Table A lists generic data requirements applicable to all products containing the pesticide subject to this Registration Standard. The data in Table A need not be submitted by a producer who is eligible for the formulator's exemption.

[2] If you purchase from another producer and use as the source of your active ingredient, only EPA-registered products, you are eligible for the formulator's exemption for generic data concerning that active ingredient (Table A). Two circumstances nullify this exemption: 1) If you change sources of active ingredient to an unregistered product, formulate your own active ingredient, or acquire your active ingredient from a firm with ownership in common with yours, you individually lose the exemption and become subject to the data requirements in Table A; 2) If no producer subject to the generic data requirements in Table A agrees to submit the required data, all end-use producers lose the exemption, and become subject to those data requirements.

VI. REQUIREMENT FOR SUBMISSION OF GENERIC DATA

This portion of the Registration Standard is a notice issued under the authority of FIFRA sec. 3(c)(2)(B). It refers to the data listed in Table A, which are required to be submitted by registrants to maintain in effect the registration of products containing this active ingredient.[3]

A. What are generic data?

Generic data pertain to the properties or effects of a particular active ingredient. Such data are relevant to an evaluation of all products containing that active ingredient regardless of whether the product contains other ingredients. (unless the product bears labeling that would make the data requirement inapplicable).

Generic data may also be data on a "typical formulation" of a product. "Typical formulation" testing is often required for ecological effects studies and applies to all products having that formulation type. These are classed as generic data, and are contained in Table A.

B. Who must submit generic data?

All current registrants are responsible for submitting generic data in response to a data request under FIFRA sec. 3(c)(2)(B) (DCI Notice). EPA has decided, however, not to require a registrant who qualifies for the formulator's exemption (FIFRA sec. 3(c)(2)(D) and § 152.85) to submit generic data in response to a DCI notice if the registrant who supplies the active ingredient in his product is complying with the data request.

If you are not now eligible for a formulator's exemption, you may qualify for one if you change your source of supply to a registered source that does not share ownership in common with your firm. If you choose to change sources of supply, the Confidential Statement of Formula must identify the new source(s) and you must submit a Formulator's Exemption Statement form.

If you apply for a new registration for products containing this active ingredient after the issuance of this Registration Standard, you will be required to submit or cite generic data relevant to the uses of your product if, at the time the application is submitted, the data have been submitted to the Agency by current registrants. If the required data have not yet been submitted, any new registration will be conditioned upon the new registrant's submission or citation of the required data not later than the date upon which current registrants of similar products are required to provide such data. See FIFRA sec. 3(c)(7)(A). If you thereafter fail to comply with the condition of that registration to provide data, the registration may be cancelled (FIFRA sec. 6(e)).

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[3] Registrations granted after issuance of this Standard will be conditioned upon submission or citation of the data listed in this Registration Standard.

C. What generic data must be submitted?

You may determine which generic data you must submit by consulting Table A. That table lists the generic data needed to evaluate current uses of all products containing this active ingredient, the uses for which such data are required, and the dates by which the data must be submitted to the Agency.

D. How to comply with DCI requirements.

Within 90 days of your receipt of this Registration Standard, you must submit to EPA a completed copy of the form entitled "FIFRA Section 3(c)(2)(B) Summary Sheet" (EPA Form 8580-1, enclosed) for each of your products. On that form you must state which of the following six methods you will use to comply with the DCI requirements:

1. You will submit the data, and either--

   (a) Submit the existing data that you believe will satisfy the data requirements, or

   (b) State that you will secure the data or have made a contract to have any necessary studies completed within the applicable time period.

2. You have entered into an agreement with one or more registrants to jointly develop (or share in the cost of developing) the data, but will not be submitting the data yourself. If you use this method, you must state who will submit the data on which you will rely. You must also provide EPA with documentary evidence that an agreement has been formed which allows you to rely upon the data to be submitted. Such evidence may be: (1) your letter offering to join in an agreement and the other registrant's acceptance of your offer, (2) a written statement by the parties that an agreement exists, or (3) a written statement by the person who will be submitting the data that you may rely upon its submission. The Agency will also require adequate assurance that the person whom you state will provide the data is taking appropriate steps to secure it. The agreement to produce the data need not specify all of the terms of the final arrangement between the parties or a mechanism to resolve the terms.

3. You have attempted to enter into an agreement to jointly develop data, but no other registrant has accepted your offer. You request that EPA not suspend your registration for non-compliance with the DCI. EPA has determined that, as a general policy, it will not suspend the registration of a product when the registrant has in good faith sought and continues to seek to enter into a data development/cost sharing program, but the other registrants developing the data have refused to accept its offer. [If your offer is accepted, you may qualify for Option 2 above by entering into an agreement to supply the data.]

In order to qualify for this method, you must:

1. File with EPA a completed "Certification of Attempt to Enter into an Agreement with other Registrants for Development of Data" (EPA Form 8580-6, enclosed).

2. Provide us with a copy of your offer to the other registrant and proof of the other registrant's receipt of your offer (such as a certified mail receipt). Your offer must, at a minimum, contain the following language or its equivalent:

> [Your company name] offers to share in the burden of producing the data required pursuant to FIFRA sec. 3(c)(2)(B) in the [name of active ingredient] Registration Standard upon terms to be agreed or failing agreement to be bound by binding arbitration as provided by FIFRA section 3(c)(2)(B)(iii).

The remainder of your offer may not in any way attempt to limit this commitment. If the other registrant to whom your offer is made does not accept your offer, and if the other registrant informs us on a DCI Summary Sheet that he will develop and submit the data required under the DCI, then you may qualify for this option. In order for you to avoid suspension under this method, you may not later withdraw or limit your offer to share in the burden of developing the data. In addition, the other registrant must fulfill its commitment to develop and submit the data.

4. You request a waiver of the data requirement. If you believe that a data requirement does not (or should not) apply to your product or its uses, you must provide EPA with a statement of the reasons why you believe this is so. Your statement must address the specific composition or use factors that lead you to believe that a requirement does not apply. Since the Agency has carefully considered the composition and uses of pesticide products in determining that a data requirement applies, EPA does not anticipate that many waivers will be granted. A request for waiver does not automatically extend the timeframes for developing required data, and if your waiver request is denied, your registration may be suspended if you fail to submit the data.

5. You request that EPA amend your registration by deleting the uses for which the data are needed. You are not required to submit data for uses which are no longer on your label.

6. You request voluntary cancellation of the registration of your product(s) for which the data are needed.

E. Procedures for requesting a change in testing protocol.

If you will generate the required data and plan to use test procedures which deviate from (or are not specified in) either EPA's Pesticide Assessment Guidelines or the Reports of Expert Groups to the Chemicals Group, Organization for Economic Cooperation and Development (OECD) Chemicals Testing Programme, you must submit for EPA approval the protocols you propose to use.

You should submit your protocols before beginning testing and await EPA approval, because the Agency will not ordinarily accept as sufficient studies using unapproved protocols. A request for protocol approval will not automatically extend the timeframe for submission of the data, nor will extensions generally be given to conduct studies due to submittal of inappropriate protocols.

F. Procedures for requesting extensions of time.

If you think that you will need more time to generate the data than is allowed by EPA's schedule, you may submit a request for an extension of time. Any request for a time extension which is made as an initial response to a section 3(c)(2)(B) request notice must be submitted in writing to the Product Manager listed at the end of this section and must be made before the deadline for response. Once dates have been committed to and EPA has accepted these commitments, any subsequent requests for a time extension must be submitted in writing to the Office of Compliance Monitoring.

EPA will view failure to request an extension before the response deadline as a waiver of any future claim that there was insufficient time to submit the data. While EPA considers your request, you must strive to meet the deadline for submitting the data.

The extension request should state the reasons why you believe that an extension is necessary and the steps you have taken to meet the testing deadline. Time extensions normally will not be granted due to problems with laboratory capacity or adequacy of funding, since the Agency believes that with proper planning these can be overcome. Time extensions may be considered when joint data development is planned, or when the Agency must approve a new or modified protocol before the study can be begun.

A request for an extension does not automatically extend the timeframe for submission of the data. If EPA denies your request for a time extension and you do not submit the data as requested, EPA may begin proceedings to suspend the registrations of your products.

G. Existing stocks provision upon suspension or cancellation.

the Agency has determined that if a registration is suspended for failure to respond to a DCI request under FIFRA sec. 3(c)(2)(B), an existing stocks provision is not consistent with the Act. Accordingly, the Agency does not anticipate granting permission to sell or distribute existing stocks of suspended product except in rare circumstances. If you believe that your product will be suspended or cancelled and that an existing stocks provision should be granted, you have the burden of clearly demonstrating to EPA that granting such permission would be consistent with the Act. The following information must be included in any request for an existing stocks provision:

1. Explanation of why an existing stocks provision is necessary, including a statement of the quantity of existing stocks and your estimate of the time required for their sale or distribution; and

2. Demonstration that such a provision would be consistent with the provisions of FIFRA.

VII. REQUIREMENT FOR SUBMISSION OF REVISED LABELING

FIFRA requires each product to be labeled with accurate, complete and sufficient instructions and precautions, reflecting the Agency's assessment of the data supporting the product and its uses. General labeling requirements are set out in 40 CFR 162.10 (see Appendix II - LABELING and SUMMARY). In addition, labeling requirements specific to products containing this pesticide are specified in Section IV.D of this Registration Standard. Applications submitted in response to this notice must include draft labeling for Agency review.

If you fail to submit revised labeling as required, which complies with 40 CFR 162.10 and the specific instructions in Section IV.D., EPA may issue a Notice of Intent to Cancel the registration of your product under FIFRA sec. 6(b)(1).

VIII. INSTRUCTIONS FOR SUBMISSION

A. Manufacturing Products (MUPs) containing Copper Compounds as the sole active ingredient.

1. Within 90 days from receipt of this document, you must submit to the Product Manager in the Registration Division for each product subject to this Registration Standard:

   a. The "FIFRA Section 3(c)(2)(B) Summary Sheet" (EPA Form 8580-1), with appropriate attachments, or Formulator's Exemption Statement.[4]

   b. Confidential Statement of Formula (EPA Form 8570-4).

   c. Evidence of compliance with data compensation requirements of FIFRA sec. 3(c)(1)(D). Refer to 40 CFR 152.80-152.99.

   d. Protocol for residue/incidence monitoring program.

2. Within 9 months from receipt of this document you must submit to the Product Manager:

   Five copies of draft labeling. Labeling should be either typewritten text on 8-1/2 x 11 inch paper or a mockup of the labeling suitable for storage in 8-1/2 x 11 files. The draft label must indicate the intended colors of the final label, clear indication of the front panel of the label, and the intended type sizes of the text.

3. Within the times set forth in Table A, you must submit to the Registration Division all generic data, unless you are eligible for the formulator's exemption. If for any reason any test is delayed or aborted so that the agreed schedule cannot be met, immediately notify the Product Manager and the Office of Compliance Monitoring of the problem, the reasons for the problem, and your proposed course of action.

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[4] If on the Summary Sheet, you commit to develop the data, present arguments that a data requirement is not applicable or should be waived, or submit protocols or modified protocols for Agency review, you must submit a copy of the Summary Sheet (and any supporting information) to the Office of Compliance Monitoring, which will be monitoring the data generated in response to this notice. This submission is in addition to responding to the Product Manager, and should be submitted to the Office of Compliance Monitoring at the address given at the end of this section. (Actual studies are not to be submitted to the Office of Compliance Monitoring.

B. End Use Products containing Copper Compounds alone or in combination with other active ingredients

1. Within 90 days from receipt of this document, you must submit to the Product Manager in the Registration Division:

a. FIFRA Section 3(c)(2)(B) Summary Sheet, with appropriate attachments[4] (EPA Form 8580-1),or Formulators Exemption Statement (EPA Form).

b. Confidential Statement of Formula (EPA Form 8570-4).

2. Within 9 months from receipt of this document you must submit to the Product Manager:

a. Five copies of draft labeling, including the container label and any associated supplemental labeling. Labeling should be either typewritten text on 8-1/2 x 11 inch paper or a mockup of the labeling suitable for storage in 8-1/2 x 11 files. The draft labeling must indicate the intended colors of the final label, clear indication of the front panel of the label, and the intended type sizes of the text. End-use product labeling must comply specifically with the instructions in Section IV (Regulatory Position and Rationale).

C. Intrastate Products containing Copper Compounds as sole active ingredient or in combination with other active ingredients.

These products are being called in for full Federal registration. Producers of these products are being sent a letter instructing them how to submit an application for registration.

D. Addresses

The required information must be submitted to the following address:

Richard F. Mountfort, PM-23
Registration Division (TS-767C)
Office of Pesticide Programs
Environmental Protection Agency
401 M St., SW
Washington, D.C. 20460

The address for submissions to the Office of Compliance Monitoring is:

Laboratory Data Integrity Program
Office of Compliance Monitoring (EN-342)
Environmental Protection Agency
401 M St., SW
Washington, DC 20460

APPENDIX I

DATA APPENDICES

GUIDE TO TABLES

Tables A, B, and C contain listings of data requirements for the pesticides covered by this Registration Standard.

Table A contains generic data requirements that apply to the pesticide in all products, including data requirements for which a "typical formulation" is the test substance.

Table B contains product-specific data requirements that apply only to a manufacturing use product.

Table C contains product-specific data requirements that apply only to an end use product.

The data tables are generally organized according to the following format:

1. Data Requirement (Column 1). The data requirements are listed in the order in which they appear in 40 CFR Part 158. The reference numbers accompanying each test refer to the test protocols set out in the Pesticide Assessment Guidelines, which are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

2. Test Substance (Column 2). This column lists the composition of the test substance required to be used for the test, as follows:

TGAI = Technical grade of the active ingredient
PAI = Pure active ingredient
PAIRA = Pure active ingredient, radio labeled
TEP = Typical end use formulation
MP = Manufacturing use product
EP = End use product

Any other test substances, such as metabolites, will be specifically named in Column 2 or in footnotes to the table.

3. Use pattern (Column 3). This column indicates the use patterns to which the data requirement applies. Use patterns are the same as those given in 40 CFR Part 158. The following letter designations are used for the given use patterns:

A = Terrestrial, food
B = Terrestrial, non-food
C = Aquatic, food
D = Aquatic, non-food
E = Greenhouse, food
F = Greenhouse, non-food
G = Forestry
H = Domestic outdoor
I = Indoor

Any other designations will be defined in a footnote to the table.

4. Does EPA have data? (Column 4). This column indicates one of three answers:

YES - EPA has data in its files that completely satisfy this data requirement. These data may be cited by other registrants in accordance with data compensation requirements of Part 152, Subpart E.

PARTIALLY - EPA has some data in its files, but such data do not fully satisfy the data requirement. In some cases, the Agency may possess data on one of two required species, or may possess data on one test substance but not all. The term may also indicate that the data available to EPA are incomplete. In this case, when the data are clarified, or additional details of the testing submitted by the original data submitter, the data may be determined to be acceptable. If this is the case, a footnote to the table will usually say so.

NO - EPA either possesses no data which are sufficient to fulfill the data requirement, or the data which EPA does possess are flawed scientifically in a manner that cannot be remedied by clarification or additional information.

5. Bibliographic citation (Column 5). If the Agency has acceptable data in its files, this column lists the identifying number of each study. This normally is the Master Record Identification (MRID) number, but may be a GS number if no MRID number has been assigned. Refer to the Bibliography Appendices for a complete citation of the study.

6. Must additional data be submitted? (Column 6). This column indicates whether the data must be submitted to the Agency. If column 3 indicates that the Agency already has data, this column will usually indicate NO. If column 3 indicates that the Agency has only partial data or no data, this column will usually indicate YES. In some cases, even though the Agency does not have the data, EPA will not require its submission because of the unique characteristics of the chemical; because data on another chemical can be used to fulfill the data requirement; or because the data requirement has been waived or reserved. Any such unusual situations will be explained in a footnote to the table.

7. Timeframe for submission (Column 7). If column 5 requires that data be submitted, this column indicates when the data are to be submitted, based on the issuance date of the Registration Standard. The timeframes are those established either as a result of a previous Data Call-In letter, or standardized timeframes established by PR Notice 85-5 (August 22, 1985).

8. Footnotes (at the end of each table). Self-explanatory.

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER AMMONIUM CARBONATE 8% FORMULATION INTERMEDIATE[a] (EPA REG. NO. 10143-2)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry Product Identity and Composition:						
61-1 - Product Identity and Disclosure of Ingredients	TGAI	All	No	N/A	Yes	6 Months
61-2 - Description of Beginning Materials and Manufacturing Process	TGAI	All	No	N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	TGAI	All	No	N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis of Product Samples	TGAI	All	No	N/A	Yes	12 Months
62-2 - Certification of Ingredient Limits	TGAI	All	No	N/A	Yes	12 Months
62-3 - Analytical Methods to Verify Certified Limits	TGAI	All	No	N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	TGAI	All	No	N/A	Yes	6 Months
63-3 - Physical State	TGAI	All	No	N/A	Yes	6 Months
63-4 - Odor	TGAI	All	No	N/A	Yes	6 Months
63-5 - Melting Point	TGAI	All	No	N/A	Yes	6 Months
63-6 - Boiling Point	TGAI	All	No	N/A	Yes	6 Months
63-7 - Density, Bulk Density, or Specific Gravity	TGAI	All	No	N/A	Yes	6 Months

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER AMMONIUM CARBONATE 8% FORMULATION INTERMEDIATE[a] (EPA REG. NO. 10143-2)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
63-8 - Solubility	TGAI or PAI		No	N/A	Yes	6 Months
63-9 - Vapor Pressure	PAI		No	N/A	Yes	6 Months
63-10 - Dissociation Constant	PAI		No	N/A	Yes	6 Months
63-11 - Octanol/Water Partition Coefficient	PAI		No	N/A	Yes	6 Months
63-12 - pH	TGAI		No	N/A	Yes	6 Months
63-13 - Stability	TGAI		No	N/A	Yes	6 Months
Other Requirement:						
64-1 - Submittal of samples	N/A		No	N/A	No 2/	

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[a] The 8% formulation intermediate serves as a manufacturing-use product.

1/ Not applicable. Although product chemistry data may been submitted in the past, the Agency has determined that these data must be resubmitted for each pesticide. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ The compound does not require samples at this time.

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER HYDROXIDE 90% TECHNICAL[a] (EPA REG. NOS. 1812-297, 48957-16, and 45002-2)
GENERIC DATA REQUIREMENTS FOR COPPER HYDROXIDE 88% FORMULATION INTERMEDIATE[b] (EPA REG. NO. 1812-292)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry Product Identity and Composition:						
61-1 - Product Identity and Disclosure of Ingredients	TGAI	All	Partially	N/A	Yes	6 Months
61-2 - Description of Beginning Materials and Manufacturing Process	TGAI	All	No	N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	TGAI	All	No	N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis of Product Samples	TGAI	All	No	N/A	Yes	12 Months
62-2 - Certification of Ingredient Limits	TGAI	All	No	N/A	Yes	12 Months
62-3 - Analytical Methods to Verify Certified Limits	TGAI	All	No	N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	TGAI	All	No	N/A	Yes	6 Months
63-3 - Physical State	TGAI	All	No	N/A	Yes	6 Months
63-4 - Odor	TGAI	All	No	N/A	Yes	6 Months
63-5 - Melting Point	TGAI	All	No	N/A	Yes	6 Months
63-6 - Boiling Point	TGAI	All	No	N/A	Yes	6 Months
63-7 - Density, Bulk Density, or Specific Gravity	TGAI	All	No	N/A	Yes	6 Months

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER HYDROXIDE 90% TECHNICAL[a] (EPA REG. NOS. 1812-297, 48957-16, and 45002-2)
GENERIC DATA REQUIREMENTS FOR COPPER HYDROXIDE 88% FORMULATION INTERMEDIATE[b] (EPA REG. NO. 1812-292)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
63-8 - Solubility	TGAI or PAI		No	N/A	Yes	6 Months
63-9 - Vapor Pressure	PAI		No	N/A	Yes	6 Months
63-10 - Dissociation Constant	PAI		No	N/A	Yes	6 Months
63-11 - Octanol/Water Partition Coefficient	PAI		No	N/A	Yes	6 Months
63-12 - pH	TGAI		No	N/A	Yes	6 Months
63-13 - Stability	TGAI		No	N/A	Yes	6 Months
Other Requirement:						
64-1 - Submittal of samples	N/A		No		No 2/	

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[a] The 90% Technical serves as a manufacturing-use product.

[b] The 88% Formulation Intermediate serves as a manufacturing product.

1/ Not applicable. Although product chemistry data may have been submitted in the past, the Agency has determined that these data must be resubmitted for each pesticide. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ The compound does not require submittal of samples at this time.

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER OXYCHLORIDE 98.75% TECHNICAL[a] (EPA REG. NO. 279-2811)
GENERIC DATA REQUIREMENTS FOR BASIC COPPER CHLORIDE 99.76% TECHNICAL[b] (EPA REG. NO. 8732-2)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry Product Identity and Composition:						
61-1 - Product Identity and Disclosure of Ingredients	TGAI	All	Partially	N/A	Yes	6 Months
61-2 - Description of Beginning Materials and Manufacturing Process	TGAI	All	No	N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	TGAI	All	No	N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis of Product Samples	TGAI	All	No	N/A	Yes	12 Months
62-2 - Certification of Ingredient Limits	TGAI	All	No	N/A	Yes	12 Months
62-3 - Analytical Methods to Verify Certified Limits	TGAI	All	No	N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	TGAI	All	No	N/A	Yes	6 Months
63-3 - Physical State	TGAI	All	No	N/A	Yes	6 Months
63-4 - Odor	TGAI	All	No	N/A	Yes	6 Months
63-5 - Melting Point	TGAI	All	No	N/A	Yes	6 Months
63-6 - Boiling Point	TGAI	All	No	N/A	Yes	6 Months
63-7 - Density, Bulk Density, or Specific Gravity	TGAI	All	No	N/A	Yes	6 Months

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER OXYCHLORIDE 98.75% TECHNICAL[a] (EPA REG. NO. 279-2811)
GENERIC DATA REQUIREMENTS FOR BASIC COPPER CHLORIDE 99.76% TECHNICAL[b] (EPA REG. NO. 8732-2)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
63-8 - Solubility	TGAI or PAI		No	N/A	Yes	6 Months
63-9 - Vapor Pressure	PAI		No	N/A	Yes	6 Months
63-10 - Dissociation Constant	PAI		No	N/A	Yes	6 Months
63-11 - Octanol/Water Partition Coefficient	PAI		No	N/A	Yes	6 Months
63-12 - pH	TGAI		No	N/A	Yes	6 Months
63-13 - Stability	TGAI		No	N/A	Yes	6 Months
Other Requirement:						
64-1 - Submittal of samples	N/A		No	N/A	No 2/	

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[a] The 98.75% Technical serves as a manufacturing-use product.
The 99.76% Technical serves as a manufacturing-use product.

1/ Not applicable. Although product chemistry data may been submitted in the past, the Agency has determined that these data must be resubmitted for each pesticide. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ The compound does not require submittal of samples at this time.

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER OXYCHLORIDE SULFATE 99.9% TECHNICAL[a] (EPA REG. NO. 55146-31)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry						
Product Identity and Composition:						
61-1 - Product Identity and Disclosure of Ingredients	TGAI	All	Partially	N/A	Yes	6 Months
61-2 - Description of Beginning Materials and Manufacturing Process	TGAI	All	No	N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	TGAI	All	No	N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis of Product Samples	TGAI	All	No	N/A	Yes	12 Months
62-2 - Certification of Ingredient Limits	TGAI	All	No	N/A	Yes	12 Months
62-3 - Analytical Methods to Verify Certified Limits	TGAI	All	No	N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	TGAI	All	No	N/A	Yes	6 Months
63-3 - Physical State	TGAI	All	No	N/A	Yes	6 Months
63-4 - Odor	TGAI	All	No	N/A	Yes	6 Months
63-5 - Melting Point	TGAI	All	No	N/A	Yes	6 Months
63-6 - Boiling Point	TGAI	All	No	N/A	Yes	6 Months
63-7 - Density, Bulk Density, or Specific Gravity	TGAI	All	Partially	N/A	Yes	6 Months

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER OXYCHLORIDE SULFATE 99.9% TECHNICAL[a] (EPA REG. NO. 55146-31)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
63-8 - Solubility	TGAI or PAI		No	N/A	Yes	6 Months
63-9 - Vapor Pressure	PAI		No	N/A	Yes	6 Months
63-10 - Dissociation Constant	PAI		No	N/A	Yes	6 Months
63-11 - Octanol/Water Partition Coefficient	PAI		No	N/A	Yes	6 Months
63-12 - pH	TGAI		No	N/A	Yes	6 Months
63-13 - Stability	TGAI		No	N/A	Yes	6 Months
Other Requirement:						
64-1 - Submittal of samples	N/A		No	N/A	No 2/	

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a The 99.9/100% Technical serves as a manufacturing-use product.

1/ Not applicable. Although product chemistry data may have been submitted in the past, the Agency has determined that these data must be resubmitted for each pesticide. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ The compound does not require samples at this time.

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER OXYCHLORIDE SULFATE, 56% TECHNICAL[a] (EPA REG. NO. 55146-5)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry Product Identity and Composition:						
61-1 - Product Identity and Disclosure of Ingredients	TGAI	All	Partially	N/A	Yes	6 Months
61-2 - Description of Beginning Materials and Manufacturing Process	TGAI	All	Partially	N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	TGAI	All	No	N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis of Product Samples	TGAI	All	No	N/A	Yes	12 Months
62-2 - Certification of Ingredient Limits	TGAI	All	No	N/A	Yes	12 Months
62-3 - Analytical Methods to Verify Certified Limits	TGAI	All	No	N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	TGAI	All	No	N/A	Yes	6 Months
63-3 - Physical State	TGAI	All	No	N/A	Yes	6 Months
63-4 - Odor	TGAI	All	No	N/A	Yes	6 Months
63-5 - Melting Point	TGAI	All	No	N/A	Yes	6 Months
63-6 - Boiling Point	TGAI	All	No	N/A	Yes	6 Months
63-7 - Density, Bulk Density, or Specific Gravity	TGAI	All	Partially	N/A	Yes	6 Months

TABLE A

GENERIC DATA REQUIREMENTS FOR COPPER OXYCHLORIDE SULFATE, 56% TECHNICAL[a] (EPA REG. NO. 55146-5)

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
63-8 - Solubility	TGAI or PAI		Partially	N/A	Yes	6 Months
63-9 - Vapor Pressure	PAI		No	N/A	Yes	6 Months
63-10 - Dissociation Constant	PAI		No	N/A	Yes	6 Months
63-11 - Octanol/Water Partition Coefficient	PAI		No	N/A	Yes	6 Months
63-12 - pH	TGAI		No	N/A	Yes	6 Months
63-13 - Stability	TGAI		No	N/A	Yes	6 Months
Other Requirement:						
64-1 - Submittal of samples	N/A		No	N/A	No 2/	

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a The 56% Technical serves as a manufacturing-use product.

1/ Not applicable. Although product chemistry data may been submitted in the past, the Agency has determined that these data must be resubmitted for each pesticide. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ The compound does not require samples at this time.

TABLE A

3/11 GENERIC DATA REQUIREMENTS FOR UNREGISTERED GROUP II COPPER COMPOUNDS, TECHNICAL PRODUCTS a/

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry Product Identity and Composition:						
61-1 - Product Identity and Disclosure of Ingredients	TGAI	All	Partially	N/A	Yes	6 Months
61-2 - Description of Beginning Materials and Manufacturing Process	TGAI	All	No	N/A	Yes	6 Months
61-3 - Discussion of Formation of Impurities	TGAI	All	No	N/A	Yes	6 Months
Analysis and Certification of Product Ingredients						
62-1 - Preliminary Analysis of Product Samples	TGAI	All	No	N/A	Yes	12 Months
62-2 - Certification of Ingredient Limits	TGAI	All	No	N/A	Yes	12 Months
62-3 - Analytical Methods to Verify Certified Limits	TGAI	All	No	N/A	Yes	12 Months
Physical and Chemical Characteristics						
63-2 - Color	TGAI	All	No	N/A	Yes	6 Months
63-3 - Physical State	TGAI	All	No	N/A	Yes	6 Months
63-4 - Odor	TGAI	All	No	N/A	Yes	6 Months
63-5 - Melting Point	TGAI	All	No	N/A	Yes	6 Months
63-6 - Boiling Point	TGAI	All	No	N/A	Yes	6 Months
63-7 - Density, Bulk Density, or Specific Gravity	TGAI	All	No	N/A	Yes	6 Months

TABLE A

GENERIC DATA REQUIREMENTS FOR UNREGISTERED GROUP II COPPER COMPOUNDS, TECHNICAL PRODUCTS a/

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation[1]	Must Addtl Data be Submitted?	Time Frame for Submission
§158.120 Product Chemistry (Continued)						
63-8 - Solubility	TGAI or PAI		No	N/A	Yes	6 Months
63-9 - Vapor Pressure	PAI		No	N/A	Yes	6 Months
63-10 - Dissociation Constant	PAI		No	N/A	Yes	6 Months
63-11 - Octanol/Water Partition Coefficient	PAI		No	N/A	Yes	6 Months
63-12 - pH	TGAI		No	N/A	Yes	6 Months
63-13 - Stability	TGAI		No	N/A	Yes	6 Months
Other Requirement:						
64-1 - Submittal of samples	N/A		No	N/A	No 2/	

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a/ Unregistered products, analogous to technicals, are likely to serve as manufacturing-use products for copper ammonium complex, copper carbonate, copper chloride dihydrate, copper nitrate and copper oxalate. Note that unregistered technicals may be used to formulate other Group II Copper Compounds.

1/ Not applicable. Although product chemistry data may been submitted in the past, the Agency has determined that these data must be resubmitted for each pesticide. New requirements have been introduced and previously submitted data must be updated. Therefore bibliographic citations for the old data are not applicable.

2/ The compound does not require samples at this time.

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test[1] Substance	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry					
171-4 - Nature of Residue (Metabolism)					
- Plants	PAIRA	Yes	00062069 00099262 00070287 00099263 00070288 00099269 00099255 00099281 00099256 00099282 00099257 00099284 00099258 00099288 00099259 00099537 00099260	No	
- Livestock	PAIRA & Plant Meatbolites	Yes	00062068	No	
171-4 - Residue Analytical Method					
- Plant residues	TGAI & Metabolites	Yes	00002200 00088167 00065678 00099522 00099551	No	
- Animal Residues	TGAI	Yes	00065678 00099551 00099522	No	
171-4 - Storage Stability Data	PAI	No		No 1/	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.125 Residue Chemistry - Continued					
171-4 - Magnitude of the Residue - Residue Studies					
o Crop					
-- Crop Field Trials Pears	TEP	Yes	GS0649-001 00002200, 00088167	No 2/	
-- Processed Food/Feed	EP	No		No 3/	
-- Meat/Milk/ Poultry/Eggs	TGAI or Plant Metabolites	No		No 3/	
- Potable Water	EP	No		No 4/	
- Fish	EP	No		No 4/	
- Irrigated Crops	EP	No		No 3/4/	
- Food Handling	EP	No		No 4/	
171-5 - Reduction of Residue	Residue of Concern	No		No 4/	
171-6 - Proposed Tolerance	Residue of Concern	No		No 4/	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

§158.125 Residue Chemistry - Continued

1/ There are no data available on storage stability on plants. In light of the exemptions from the requirements of a tolerance established for copper, and since it occurs naturally in plants and animals, no storage stability studies are necessary.

2/ The Agency intends to revoke the existing tolerance of 3 ppm combined copper on pears as being unnecessary to protect human health. Thus additional data to support the tolerance on pears are not required.

3/ When applied to growing crops in accordance with good agricultural practices, copper carbonate, copper hydroxide, and copper oxychloride are exempt from the requirements of a tolerance (40 CFR 180.1001(a)(1).

4/ Copper is exempted from the requirements of a tolerance in meat, milk, poultry/eggs, potable water, fish, irrigated crops when it is used, as an algicide or herbicide in irrigation water systems, lakes, ponds, reservoirs, or other bodies of water (40 CFR 180.1021(a)).

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.130 Environmental Fate						
DEGRADATION STUDIES-LAB:						
161-1 - Hydrolysis	TGAI or PAIRA	A,B,C,D, F,H,	No		No 1/	
Photodegradation						
161-2 - In water	TGAI or PAIRA	A,B,C,D, F,H,	No		No 2/	
161-3 - On soil	TGAI or PAIRA	A,B	No		No 2/	
161-4 - In Air	TGAI or PAIRA	A,B	No		No 2/	
METABOLISM STUDIES-LAB:						
162-1 - Aerobic Soil	TGAI or PAIRA	A,B,C,D	No		No 3/	
162-2 - Anaerobic Soil	TGAI or PAIRA	A,B	No		No 3/	
162-3 - Anaerobic Aquatic	TGAI or PAIRA	C,D	No		No 3/	
162-4 - Aerobic Aquatic	TGAI or PAIRA	C,D	No		No 3/	
MOBILITY STUDIES:						
163-1 - Adsorption/ Desorption	TGAI or PAIRA	A,B,C,D, E,F,H	No		Yes 4/	12 Months
163-2 - Volatility (Lab)	TEP	A,B,E,F	No		No 5/	
163-3 - Volatility (Field)	TEP	A,B,E,F	No		No 5/	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.130 Environmental Fate - Continued						
DISSIPATION STUDIES-FIELD:						
164-1 - Soil	TEP	A,B,C	No		Yes 6/	27 Months
164-2 - Aquatic (Sediment)	TEP	C,D	No		Yes 6/	27 Months
164-3 - Forestry	TEP	N/A 7/				
164-4 - Combination and Tank Mixes	- -	N/A 8/				
164-5 - Soil, Long-term	TEP	A,B,H	No		No 3/	
ACCUMULATION STUDIES:						
165-1 - Rotational Crops (Confined)	PAIRA	A,B,C	No		No 3/	
165-2 - Rotational Crops (Field)	TEP	A,B,C	No		No 3/	
165-3 - Irrigated Crops	TEP	A,C,D	No		No 3/	
165-4 - In Fish	TGAI or PAIRA	A,B,C,D	No		No 3/	
165-5 - In Aquatic Non-Target Organisms	TEP	D	No		No 3/	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

§158.130 Environmental Fate - Continued

1/ A hydrolysis study is not required because these pesticides are inorganic compounds and will not hydrolyze.
2/ Data are not required because these pesticides are inorganic compounds and are resistant to photolysis.
3/ The Guidelines and use patterns indicate that these data are not required.
4/ The domestic outdoor, greenhouse, and aquatic uses will require a basic equilibrium (adsorption/desorption) test, but not a leaching study as described in the guidelines 163-1.
5/ Data are not required, because the compounds have a low vapor pressure and do not volatilize readily.

6/ Data are required to clarify the following: (a) Will copper ion leave treated fields via runoff or other mechanisms and enter aquatic systems; (b) Once in the aquatic system, will the copper ion remain in solution or will it become unavailable for impact on aquatic organisms (e.g. via adsorption to sediment or precipitation)?

The guideline testing protocols for soil and aquatic sediment dissipation studies (164-1,2) will need to be modified for these copper compounds. Registrants must consult with the Agency to agree on acceptable protocols for meeting these data requireemnts, prior to initiating testing.

7/ Data are not required because there are no forestry uses.
8/ The data requirements for combination and tank mixes are not addressed in this Standard.

TABLE A

GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Pattern	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.140 Reentry Protection						
132-1 - Foliar Dissipation	TEP	A,B,C,D	No		No 1/	
132-1 - Soil Dissipation	TEP	A,B,C,D	No		No 1/	
133-3 - Dermal Exposure	TEP	A,B,C,D	No		No 1/	
133-4 - Inhalation Exposure	TEP	A,B,C,D	No		No 1/	
§158.142 Spray Drift						
201-1 - Droplet Size Spectrum	TEP	Reserved 2/				
201-1 - Drift Field Evaluation	TEP	Reserved 2/				
Special Tests		N/A 1/				

1/ Available data indicate that there are no toxicological concerns with regards to reentry exposure of the Group II Copper Compounds by workers.

2/ Reserved: Data may be required to clarify the following: (a) Will copper ion leave treated fields via runoff or other mechanisms and enter aquatic systems; (b) Once in the aquatic system, will the copper ion remain in solution or will it become unavailable for impact on aquatic organisms (e.g. via adsorption to sediment or precipitation)?

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Date Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted	Time Frame for Submission
§158.135 Toxicology						
ACUTE TESTING:						
81-1 - Acute Oral Toxicity	TGAI 1/	A,B,C,D E,F,H,I	Partially	00053980,00133277, 00152506,00155931, 00159371	Yes 1/	9 Months
81-2 - Acute Dermal Toxicity	TGAI 2/	A,B,C,D E,F,H,I	Partially	00053980,00126194, 00152505,00159371	Yes 2/	9 Months
81-3 - Acute Inhalation Toxicity	TGAI	A,B,C,D E,F,H,I	Partially	00155932,00159371, 00160580	No 3/	
81-4 - Primary Eye Irritation	MP 2/	A,B,C,D, E,F,H,I	Partially	00053980,00126194, 00152503,00155934	Yes 2/	9 Months
81-5 - Primary Dermal Irritation	MP 2/	A,B,C,D, E,F,H,I	Partially	00053980,00126194, 00152502,00155935, 00159371	Yes 2/	9 Months
81-6 - Dermal Sensitization	TGAI	A,B,C,D E,F,H,I	Partially	00152504,00155936	No 4/	
SUBCHRONIC TESTING:						
82-1 - 90-Day Feeding - Rodent Nonrodent (dog)	TGAI	A,B,C,D, E,F,H,I	No		No 5/	
82-2 - 21-Day Dermal	TGAI	A,B,C,D, E,F,H,I	No		No 5/	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Patterns	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.135 Toxicology - Continued						
SUBCHRONIC TESTING:						
82-3 - 90-Day Dermal	TGAI	A,B,C,D, E,F,H,I	No		No 5/	
82-4 - 90-Day Inhalation	TGAI	A,B,C,D, E,F,H,I	No		No 5/	
CHRONIC TESTING:						
83-1 - Chronic Toxicity -	TGAI	A,B,C,D, E,F,H,I	No		No 5/	
Rodent (rat)						
Nonrodent (dog)						
83-2 - Oncogenicity -	TGAI	A,B,C,D, E,F,H,I	No		No 5/	
Rat						
Mouse						
83-3 - Teratogenicity -	TGAI	A,B,C,D, E,F,H,I	No		No 5/	
Rat						
Rabbit						
83-4 - Reproduction - 2-generation	TGAI	A,B,C,D, E,F,H,I	No		No 5/	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Pattern	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.135 Toxicology - Continued						
MUTAGENICITY TESTING						
84-2 - Gene Mutation (Ames Test)	TGAI	A,B,C,D E,F,H,I	No		No 5/	
84-2 - Structural Chromosomal Aberration	TGAI	A,B,C,D, E,F,H,I	No		No 5/	
84-2 - Other Genotoxic Effects	TGAI	A,B,C,D, E,F,H,I	No		No 5/	

1/ Data are required for: copper ammonium complex, copper ammonium carbonate, and copper oxalate. NOTE: If there are no registered technical/manufacturing-use products for these compounds, a representative end-use formulation should be tested.

2/ Data are required for: copper ammonium complex, copper ammonium carbonate, basic copper chloride, copper citrate, copper chloride dihydrate, copper oxalate and copper nitrate. NOTE: If registered technical/manufacturing-use products do not exist, a representative end-use formulation should be tested.

3/ Toxicological concerns for acute inhalation exposure is usually only in the industrial setting such as metal works, and is not considered a significant concern for pesticide application. There is a threshhold limit value (TLV) of 1 mg/m^3 for all copper dusts or mists (on a "time weighted average" [TWA] basis) established by the American Conference of Governmental Industrial Hygientists: Documentation of Threshhold Limit Values for Substances in the Workplace, 3rd Edition, 1971.

4/ Copper is a recognized dermal sensitizer, therefore data will not be required on any of the chemicals in the Group II Copper Compounds. Data may be submitted or cited, however, to rebut this conclusion for specific products.

5/ The element of toxicological concern in these Group II Copper Compounds is the copper ion, and although the Agency does not have Guideline-quality studies for this data requirement per se, there is adequate information in the extensive open literature on copper (ion) to characterize its toxicity.

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Pattern	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.145 Wildlife and Aquatic Organisms						
AVIAN AND MAMMALIAN TESTING						
71-1 - Avian Oral LD_{50}	TGAI	A1/,B2/,D3/	Yes4/	00067455 5/ 00067456 5/	No 4/6/	
71-2 - Avian Dietary LC_{50} a. Waterfowl	TGAI	A1/,B2/,D3/	Yes	00067454 5/	No 4/	
b. Upland game bird	TGAI TEP	A1/,B2/,D3/ A1/	Yes Partially	00106119 5/ GS0649-002 7/**	No 4/ No	
71-3 - Wild Mammal Toxicity	TGAI	A1/,B2/,D3/	No		No 8/	
71-4 - Avian Reproduction a. Waterfowl	TGAI	A1/	No		Yes 9/	24 Months
b. Upland game bird	TGAI	A1/,B2/	No		Yes 9/	24 Months
71-5 - Simulated and Actual Field Testing - - Mammals, and - Birds	TEP	A1/,B2/,D3/	No		Reserved 10/	
Actual Field Testing - Mammals, and - Birds	TEP	A1/,B2/,D3/	No		Reserved 10/	
AQUATIC ORGANISM TESTING						
72-1 - Acute Toxicity Freshwater Fish a. warmwater	TGAI	A1/,B2/,D3/	Yes	GS0649-003 11/ GS0649-004 11/ 00099374 5/	No	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Pattern	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.145 Wildlife and Aquatic Organisms						
AQUATIC ORGANISM TESTING						
72-1 - Acute Toxicity Freshwater Fish						
a. warmwater (cont'd)	TGAI					
	TEP		Yes	00047460 5/ GS0649-005 13/	No 14/	
b. coldwater	TGAI	A1/,B2/,D3/	Yes	GS0649-004 11/ 00099371 12/ 00099370 12/ 00047460 5/ 00099168 5/ 00056781 5/	No	
	TEP			00099355 15/ GS0649-006 13/		
72-2 - Acute LC$_{50}$ Freshwater Invertebrates	TGAI	A1/,B2/,D3/	Yes	00099558 5/	No 16/	
72-3 - Acute LC$_{50}$ Estuarine and Marine Organisms	TGAI	A1/,D3/17/	Yes	00085289 5/18/ 00099559 5/18/ 00099561 5/19/ 00028002 5/20/** 00086564 5/21/**	No	
72-4 - Fish Early Life Stage and Aquatic Invertebrate Life-Cycle	TGAI	A1/,B2/,D3/	Yes	GS0649-007	No 22/	

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

Data Requirement	Test Substance	Use Pattern	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.145 Wildlife and Aquatic Organisms						
AQUATIC ORGANISM TESTING						
72-5 - Fish full life-cyle	TGAI	A1/,B2/,D3/	Yes	GS0649-007	No 22/	
72-6 - Aquatic Organism Accumulation	TGAI, PAI OR Degradation Product		No		No 22/	
- Crustacean						
- Fish						
- Insect Nymph						
- Mollusk						
72-7 - Simulated Field Testing	TEP	A1/,B2/,D3/	No		Reserved 23/	
- Aquatic Organisms						
- Actual Field Testing						
- Aquatic Organisms						
70-1 - Special Testing	TEP	A1/	No		Yes 24/	3 Months 24/ (Protocol)

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

§158.145 Wildlife and Aquatic Organisms - Continued

1/ The following compounds are registered for Terrestrial, Food Crops:

Chemical Name	Type	Shaughnessy No.
Copper Ammonium Carbonate	F	022703
Copper Ammonium Complex	F	022702
Copper Carbonate	F	022901
Copper Hydroxide	F,H	023401
Copper Oxalate	B	023305
Copper Oxychloride	F	023501
Copper Oxychloride Sulfate	F	022702

F-Fungicide; H-Herbicide; B-Bird Repellent

2/ The following compounds are registered for Terrestrial, Nonfood Crops:

Copper Ammonium Complex (ornamental plants, forest trees, wood treatment)
Copper Chloride Dihydrate (orchid and flower bulb medium)
Copper Hydroxide (ornamental plants, forest trees)
Copper Oxychloride (ornamental plants, forest trees)
Copper Oxychloride Sulfate (ornamental plants, tobacco, forest trees)

3/ The following compounds are registered for Aquatic Nonfood Crops:

Copper citrate and copper nitrate.

4/ The studies which satisfy this requirement for group II copper compounds were conducted with copper sulfate which is not one of the copper compounds included in this standard.

5/ Conducted with copper sulfate, taken from copper sulfate registration standard dated March 21, 1985.

6/ The avian acute oral LD_{50} would only be required for cooling tower and industrial water treatment (copper citrate a copper nitrate). However, these studies will not be required for this Registration Standard since the results from the copper sulfate tests are being used to indicate acute oral toxicity for all group II copper compounds.

7/ Conducted with 51% MCE formulation of copper carbonate called Nutra-spray. This test may be upgraded if additional description of procedure is provided.

8/ Copper compounds are considered to be low in toxicity to mammals, therefore the study is not required.

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

§158.145 Wildlife and Aquatic Organisms - Continued

9/ Avian reproduction tests are required for copper hydroxide and copper oxychloride sulfate. If these compounds exhibit unusually high chronic toxicity, tests with other compounds may be required.
10/ Reserved pending receipt of avian reproduction studies.
11/ Conducted with copper oxychloride.
12/ Conducted with copper hydroxide.
13/ Conducted with 50 MCE formulation of copper oxychloride sulfate.
14/ Formulated testing is not a requirement for copper oxychloride sulfate.
15/ Conducted with 8% MCE formulation of copper ammonium carbonate.
16 Data from tests with copper sulfate and the EPA Ambient Water Quality Criteria for Copper - 1984 document (GS0649-007) fulfill this requirement.
17/ Not required for copper chloride, copper oxalate, or copper chloride dihydrate.
18/ Pink shrimp LC_{50}.
19/ Oyster LC_{50}.
20/ Striped bass LC_{50}.
21/ Pompano LC_{50}.
22/ Data from EPA Water Quality Document for Copper - 1984 is sufficient to characterize the chronic toxicity of copper compounds to fish and aquatic invertebrates.
23/ Reserved pending receipt of information from residue and incidence monitoring.

24/ Residue and incidence monitoring: See Table 3 for copper compounds requiring monitoring and specific use sites which trigger residue monitoring or residue and incidence monitoring.

Residue monitoring would include taking samples of water and sediment from several locations for each use triggering residue monitoring. These samples must be analyzed for total recoverable copper and acid-soluble copper as defined in the EPA Water Quality Criteria for Copper - 1984.

Incidence monitoring means structured searches for evidence of acute response of aquatic organisms to the presence of copper. This must be conducted at several locations throughout the use areas triggering this type of monitoring. Incidence monitoring would be primarily fish kills but could also include other observeable evidence of acute toxicity including that demonstrated by invertebrates. It would be acceptable to conduct incidence and residue monitoring concurrently at the same locations for those sites that require both types of monitoring. In any case, residue monitoring must accompany incidence monitoring to include analysis of any dead or moribund fish found.

Within three months of issuance, registrants must submit a proposed monitoring program protocol incorporating the types of monitoring described above which are required for their chemicals/use patterns indicated in the table below. Once the Agency accepts a monitoring program plan, both types of monitoring must be conducted until the results provide data adequate to determine whether these copper compounds pose risk to aquatic organisms, and if so, to quantify those risks. The Agency will review annual reports of monitoring results until a final determination on this issue is made.

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

§158.145 Wildlife and Aquatic Organisms - Continued

Table 3: Copper compounds and the specific sites that require monitoring:

USE SITE	SHAUGHNESSY NUMBERS FOR COPPER COMPOUNDS			
	022703	023501	023503	023401
Alfalfa	-	-	-	R I
Apples	-		R	-
Barley	-	-	-	R I
Beans	R I		R I	R I
Peanuts	R	R	-	R I
Soybeans	R	-	-	-
Sugar beets	R	R I	R I	R I
Citrus	R I	R I	R I	R I

R- Residue Monitoring
I- Incidence Monitoring for Acute Effects to Aquatic Organisms

* Fulfills requirement on its own.
** Could fulfill requirement in conjunction with other test data.

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS:
(Copper ammonium carbonate, copper ammonium complex,
copper carbonate, copper hyroxide, and copper oxychloride)

Data Requirement	Test Substance	Use Pattern	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.155 Nontarget Insect						
NONTARGET INSECT TESTING - POLLINATORS:						
141-1 - Honey bee acute contact toxicity	TGAI	A,B	No	-	Yes	9 Months
141-2 - Honey bee - toxicity of residues on foliage	TEP	A,B	No		No 1/	
141-4 - Honey bee subacute feeding study	(Reserved) 2/					
141-5 - Field testing for pollinators	TEP	A,B	No		No 1/	
NONTARGET INSECT TESTING - AQUATIC INSECTS:						
142-1 - Acute toxicity to aquatic insects	(Reserved) 3/					
142-1 - Aquatic insect life-cycle study	(Reserved) 3/					
142-3 - Simulated or actual field testing for aquatic insects	(Reserved) 3/					
143-1 thru 143-3 - NONTARGET INSECT TESTING - PREDATORS AND PARASITES	(Reserved) 3/					

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS

1/ Data requirement is reserved pending receipt of data from the acute contact study.
2/ Data requirement is reserved pending development of test methodology.
3/ Data requirement is reserved pending an Agency decision as to whether the data requirement should be established.

TABLE A

GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS (Copper Oxychloride Sulfate)

Data Requirement	Test Substance	Use Pattern	Does EPA Have Data?	Bibliographic Citation	Must Addtl Data be Submitted?	Time Frame for Submission
§158.155 Nontarget Insect						
NONTARGET INSECT TESTING - POLLINATORS:						
141-1 - Honey bee acute contact toxicity	TGAI	A,B	Yes	00036935	No	
141-2 - Honey bee - toxicity of residues on foliage	TEP	A,B	No		No 1/	
141-4 - Honey bee subacute feeding study	(Reserved) 2/					
141-5 - Field testing for pollinators	TEP	A,B			No 1/	
NONTARGET INSECT TESTING - AQUATIC INSECTS:						
142-1 - Acute toxicity to aquatic insects	(Reserved) 3/					
142-1 - Aquatic insect life-cycle study	(Reserved) 3/					
142-3 - Simulated or actual field testing for aquatic insects	(Reserved) 3/					
143-1 thru 143-3 - NONTARGET INSECT TESTING - PREDATORS AND PARASITES	(Reserved) 3/					

TABLE A
GENERIC DATA REQUIREMENTS FOR GROUP II COPPER COMPOUNDS
(Copper Oxychloride Sulfate)

1/ Data from the acute contact study indicate low toxicity to honey bees, therefore further testing is not required.
2/ Data requirement is reserved pending development of test methodology.
3/ Data requirement is reserved pending an Agency decision as to whether the data requirement should be established.

APPENDIX II

LABELING APPENDICES

SUMMARY-1

LABEL CONTENTS

40 CFR 162.10 requires that certain specific labeling statements appear at certain locations on the label. This is referred to as format labeling. Specific label items listed below are keyed to the table at the end of this Appendix.

Item 1. PRODUCT NAME - The name, brand or trademark is required to be located on the front panel, preferably centered in the upper part of the panel. The name of a product will not be accepted if it is false or misleading.

Item 2. COMPANY NAME AND ADDRESS - The name and address of the registrant or distributor is required on the label. The name and address should preferably be located at the bottom of the front panel or at the end of the label text.

Item 3. NET CONTENTS - A net contents statement is required on all labels or on the container of the pesticide. The preferred location is the bottom of the front panel immediately above the company name and address, or at the end of the label text. The net contents must be expressed in the largest suitable unit, e.g., "1 pound 10 ounces" rather than "26 ounces." In addition to English units, net contents may be expressed in metric units. [40 CFR 162.10(d)]

Item 4. EPA REGISTRATION NUMBER - The registration number assigned to the pesticide product must appear on the label, preceded by the phrase "EPA Registration No.," or "EPA Reg. No." The registration number must be set in type of a size and style similar to other print on that part of the label on which it appears and must run parallel to it. The registration number and the required identifying phrase must not appear in such a manner as to suggest or imply recommendation or endorsement of the product by the Agency. [40 CFR 162.10(e)]

Item 5. EPA ESTABLISHMENT NUMBER - The EPA establishment number, preceded by the phrase "EPA Est." is the final establishment at which the product was produced, and may appear in any suitable location on the label or immediate container. It must also appear on the wrapper or outside container of the package if the EPA establishment number on the immediate container cannot be clearly read through such wrapper or container. [40 CFR 162.10(f)]

Item 6A. INGREDIENTS STATEMENT - An ingredients statement is required on the front panel. The ingredients statement must contain the name and percentage by weight of each active ingredient and the total percentage by weight of all inert ingredients. The preferred location is immediately below the product name. The ingredients statement must run parallel with, and be clearly distinguished from, other text on the panel. It must not be placed in the body of other text. [40 CFR 162.10(g)]

Item 6B. POUNDS PER GALLON STATEMENT - For liquid agricultural formulations, the pounds per gallon of active ingredient must be indicated on the label.

Item 7. FRONT LABEL PRECAUTIONARY STATEMENTS - Front panel precautionary statements must be grouped together, preferably within a block outline. The table below shows the minimum type size requirements for various size labels.

Size of Label on Front Panel in Square Inches	Signal Word Minimum Type Size All Capitals	"Keep Out of Reach of Children" Minimum Type Size
5 and under	6 point	6 point
above 5 to 10	10 point	6 point
above 10 to 15	12 point	8 point
above 15 to 30	14 point	10 point
over 30	18 point	12 point

Item 7A. CHILD HAZARD WARNING STATEMENT - The statement "Keep Out of Reach of Children" must be located on the front panel above the signal word except where contact with children during distribution or use is unlikely. [40 CFR 162.10(h)(1)(ii)]

Item 7B. SIGNAL WORD - The signal word (DANGER, WARNING, or CAUTION) is required on the front panel immediately below the child hazard warning statement. [40 CFR 162.10 (h)(1)(i)]

Item 7C. SKULL & CROSSBONES AND WORD "POISON" - On products assigned a toxicity Category I on the basis of oral, dermal, or inhalation toxicity, the word "Poison" shall appear on the label in red on a background of distinctly contrasting color and the skull and crossbones shall appear in immediate proximity to the word POISON. [40 CFR 162.10(h)(1)(i)]

Item 7D. STATEMENT OF PRACTICAL TREATMENT - A statement of practical treatment (first aid or other) shall appear on the label of pesticide products in toxicity Categories I, II, and III. [40 CFR 162.10(h)(1)(iii)]

Item 7E. REFERRAL STATEMENT - The statement "See Side (or Back) Panel for Additional Precautionary Statements" is required on the front panel for all products, unless all required precautionary statements appear on the front panel. [40 CFR 162.10(h)(1)(iii)]

Item 8. SIDE/BACK PANEL PRECAUTIONARY LABELING - The precautionary statements listed below must appear together on the label under the heading "PRECAUTIONARY STATEMENTS." The preferred location is at the top of the side or back panel preceding the directions for use, and it is preferred that these statements be surrounded by a block outline. Each of the three hazard warning statements must be headed by the appropriate hazard title. [40 CFR 162.10(h)(2)].

Item 8A. HAZARD TO HUMANS AND DOMESTIC ANIMALS - Where a hazard exists to humans or domestic animals, precautionary statements are required indicating the particular hazard, the route(s) of exposure and the precautions to be taken to avoid accident, injury or damage. [40 CFR 162.10(h)(2)(i)]

Item 8B. ENVIRONMENTAL HAZARD - Where a hazard exists to non-target organisms excluding humans and domestic animals, precautionary statements are required stating the nature of the hazard and the appropriate precautions to avoid potential accident, injury, or damage. [40 CFR 162.10(h)(2)(ii)]

Item 8C. PHYSICAL OR CHEMICAL HAZARD - FLAMMABILITY Precautionary statements relating to flammability of a product are required to appear on the label if it meets the criteria in the PHYS/CHEM Labeling Appendix. The requirement is based on the results of the flashpoint determinations and flame extension tests required to be submitted for all products. These statements are to be located in the side/back panel precautionary statements section, preceded by the heading "Physical/Chemical Hazards." Note that no signal word is used in conjunction with the flammability statements.

Item 9A. RESTRICTED USE CLASSIFICATION - FIFRA sec. 3(d) requires that all pesticide formulations/uses be classified for either general or restricted use. Products classified for restricted use may be limited to use by certified applicators or persons under their direct supervision (or may be subject to other restrictions that may be imposed by regulation).

In the Registration Standard, the Agency has (1) indicated certain formulations/uses are to be restricted (Section IV indicates why the product has been classified for restricted use); or (2) reserved any classification decision until appropriate data are submitted.

The Regulatory Position and Rationale states whether products containing this active ingredient are classified for restricted use. If they are restricted the draft label(s) submitted to the Agency as part of your application must reflect this determination (see below).

If you do not believe that your product should be classified for restricted use, you must submit any information and rationale with your application for reregistration. During the Agency's review of your application, your proposed classification determination will be evaluated in accordance with the provisions of 40 CFR 162.11(c). You will be notified of the Agency's classification decision.

Classification Labeling Requirements

If your product has been classified for restricted use, the following label requirements apply:

1. All uses restricted.

a. The statement "Restricted Use Pesticide" must appear at the top of the front panel of the label. The statement must be set in type of the same minimum size as required for human hazard signal word (see table in 40 CFR 162.10(h)(1)(iv)

b. Directly below this statement on the front panel, a summary statement of the terms of restriction must appear (including the reasons for restriction if specified in Section I). If use is restricted to certified applicators, the following statement is required: "For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification."

2. Some but not all uses restricted. If the Regulatory Position and Rationale states that some uses are classified for restricted use, and some are unclassified, several courses of action are available:

a. You may label the product for Restricted use. If you do so, you may include on the label uses that are unrestricted, but you may not distinguish them on the label as being unrestricted.

b. You may delete all restricted uses from your label and submit draft labeling bearing only unrestricted uses.

c. You may "split" your registration, i.e., register two separate products with identical formulations, one bearing only unrestricted uses, and the other bearing restricted uses. To do so, submit two applications for reregistration, each containing all forms and necessary labels. Both applications should be submitted simultaneously. Note that the products will be assigned separate registration numbers.

Item 9B. MISUSE STATEMENT - All products must bear the misuse statement, "It is a violation of Federal law to use this product in a manner inconsistent with its labeling." This statement appears at the beginning of the directions for use, directly beneath the heading of that section.

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Item 10A. REENTRY STATEMENT - If a reentry interval has been established by the Agency, it must be included on the label. Additional worker protection statements may be required in accordance with PR Notice 83-2, March 29, 1983.

Item 10B. STORAGE AND DISPOSAL BLOCK - All labels are required to bear storage and disposal statements. These statements are developed for specific containers, sizes, and chemical content. These instructions must be grouped and appear under the heading "Storage and Disposal" in the directions for use. This heading must be set in the same type sizes as required for the child hazard warning. Refer to Appendix II, STOR, PEST/DIS, and CONT/DIS to determine the storage and disposal instructions appropriate for your products.

Item 10C. DIRECTIONS FOR USE - Directions for use must be stated in terms which can be easily read and understood by the average person likely to use or to supervise the use of the pesticide. When followed, directions must be adequate to protect the public from fraud and from personal injury and to prevent unreasonable adverse effects on the environment. [40 CFR 162.10]

COLLATERAL LABELING

Bulletins, leaflets, circulars, brochures, data sheets, flyers, or other written or graphic printed matter which is referred to on the label or which is to accompany the product are termed collateral labeling. Such labeling may not bear claims or representations that differ in substance from those accepted in connection with registration of the product. It should be made part of the response to this notice and submitted for review.

SUMMARY-6

LABELING REQUIREMENTS OF THE FIFRA, AS AMENDED

ITEM	LABEL ELEMENT	APPLICABILITY OF REQUIREMENT	PLACEMENT ON LABEL REQUIRED	PLACEMENT ON LABEL PREFERRED	COMMENTS
1	Product name	All products	Front panel	Center front panel	
2	Company name and address	All products	None	Bottom front panel or end of label text	If registrant is not the producer, must be qualified by "Packed for . . .," "Distributed by. . .," etc.
3	Net contents	All products	None	Bottom front panel or end of label text	May be in metric units in addition to U.S. units
4	EPA Reg. No.	All products	None	Front panel	Must be in similar type size and run parallel to other type.
5	EPA Est. No.	All products	None	Front panel, immediately before or following Reg. No.	May appear on the container instead of the label.
6A	Ingredients statement	All products	Front panel	Immediately following product name	Text must run parallel with other text on the panel.
6B	Pounds/gallon statement	Liquid products where dosage given as lbs. ai/unit area	Front panel	Directly below the main ingredients statement	
7	Front panel precautionary statements	All products	Front panel		All front panel precautionary statements must be grouped together, preferably blocked.
7A	Keep Out of Reach of Children (Child hazard warning)	All products	Front panel	Above signal word	Note type size requirements.
7B	Signal word	All products	Front panel	Immediately below child hazard warning	Note type size requirements.

SUMMARY-7

ITEM	LABEL ELEMENT	APPLICABILITY OF REQUIREMENT	PLACEMENT ON LABEL		COMMENTS
			REQUIRED	PREFERRED	
7C	Skull & crossbones and word POISON (in red)	All products which are Category I based on oral, dermal, or inhalation toxicity	Front panel	Both in close proximity to signal word	
7D	Statement of Practical Treatment or First Aid	All products in Categories I, II, and III	Category I: Front panel unless referral statement is used. Others: Grouped with side panel precautionary statements.	Front panel for all.	
7E	Referral statement	All products where precautionary labeling appears on other than front panel.	Front panel		
8	Side/back panel precautionary statements	All products	None	Top or side of back panel preceding directions for use	Must be grouped under the headings in 8A, 8B, and 8C; preferably blocked.
8A	Hazards to humans and domestic animals	All products in Categories I, II, and III	None	Same as above	Must be preceded by appropriate signal word.
8B	Environmental hazards	All products	None	Same as above	Environmental hazards include bee caution where applicable.

SUMMARY-8

ITEM	LABEL ELEMENT	APPLICABILITY OF REQUIREMENT	PLACEMENT ON LABEL REQUIRED	PLACEMENT ON LABEL PREFERRED	COMMENTS
8C	Physical or chemical hazards	All pressurized products, others with flash points under 150°F	None	Same as above	Refer to Appendix II guide PHYS/CHEM
9A	Restricted block	All restricted products	Top center of front panel	Preferably blocked	Includes a statement of the terms of restriction. The words "RESTRICTED USE PESTICIDE" must be same type size as signal word.
9B	Misuse statement	All products	Immediately following heading of directions for use		Required statement is: "It is a violation of Federal law to use this product in a manner inconsistent with its labeling."
10A	Reentry statement	PR Notice 83-2 or as determined by the Agency	In the directions for use	Immediately after misuse statement	
10B	Storage and disposal block	All products	In the directions for use	Immediately before specific directions for use or at the end of directions for use	Must be set apart and clearly distinguishable from from other directions for use. Refer to Appendix II guides STOR, CONT/DIS, and PEST/DIS for further information and required statements.
10C	Directions for use	All products	None	None	May be in metric as well as U.S. units

§ 162.10 Labeling requirements.

(a) *General*—(1) *Contents of the label.* Every pesticide products shall bear a label containing the information specified by the Act and the regulations in this Part. The contents of a label must show clearly and prominently the following:

(i) The name, brand, or trademark under which the product is sold as prescribed in paragraph (b) of this section;

(ii) The name and address of the producer, registrant, or person for whom produced as prescribed in paragraph (c) of this section;

(iii) The net contents as prescribed in paragraph (d) of this section;

(iv) The product registration number as prescribed in paragraph (e) of this section;

(v) The producing establishment number as prescribed in paragraph (f) of this section;

(vi) An ingredient statement as prescribed in paragraph (g) of this section;

(vii) Warning or precautionary statements as prescribed in paragraph (h) of this section;

(viii) The directions for use as prescribed in paragraph (i) of this section; and

(ix) The use classification(s) as prescribed in paragraph (j) of this section.

(2) *Prominence and legibility.* (i) All words, statements, graphic representations, designs or other information required on the labeling by the Act or the regulations in this part must be clearly legible to a person with normal vision, and must be placed with such conspicuousness (as compared with other words, statements, designs, or graphic matter on the labeling) and expressed in such terms as to render it likely to be read and understood by the ordinary individual under customary conditions of purchase and use.

(ii) All required label text must:

(A) Be set in 6-point or larger type;

(B) Appear on a clear contrasting background; and

(C) Not be obscured or crowded.

(3) *Language to be used.* All required label or labeling text shall appear in the English language. However, the Agency may require or the applicant may propose additional text in other languages as is considered necessary to protect the public. When additional text in another language is necessary, all labeling requirements will be applied equally to both the English and other-language versions of the labeling.

(4) *Placement of Label—*(i) *General.* The label shall appear on or be securely attached to the immediate container of the pesticide product. For purposes of this Section, and the misbranding provisions of the Act, "securely attached" shall mean that a label can reasonably be expected to remain affixed during the foreseeable conditions and period of use. If the immediate container is enclosed within a wrapper or outside container through which the label cannot be clearly read, the label must also be securely attached to such outside wrapper or container, if it is a part of the package as customarily distributed or sold.

(ii) *Tank cars and other bulk containers—*(A) *Transportation.* While a pesticide product is in transit, the appropriate provisions of 49 CFR Parts 170-189, concerning the transportation of hazardous materials, and specifically those provisions concerning the labeling, marking and placarding of hazardous materials and the vehicles carrying them, define the basic Federal requirements. In addition, when any registered pesticide product is transported in a tank car, tank truck or other mobile or portable bulk container, a copy of the accepted label must be attached to the shipping papers, and left with the consignee at the time of delivery.

(B) *Storage.* When pesticide products are stored in bulk containers, whether mobile or stationary, which remain in the custody of the user, a copy of the label of labeling, including all appropriate directions for use, shall be securely attached to the container in the immediate vicinity of the discharge control valve.

(5) *False or misleading statements.* Pursuant to section 2(q)(1)(A) of the Act, a pesticide or a device declared subject to the Act pursuant to § 162.15, is misbranded if its labeling is false or misleading in any particular including both pesticidal and non-pesticidal claims. Examples of statements or representations in the labeling which constitute misbranding include:

(i) A false or misleading statement concerning the composition of the product;

(ii) A false or misleading statement concerning the effectiveness of the product as a pesticide or device;

(iii) A false or misleading statement about the value of the product for purposes other than as a pesticide or device;

(iv) A false or misleading comparison with other pesticides or devices;

(v) Any statement directly or indirectly implying that the pesticide or device is recommended or endorsed by any agency of the Federal Government;

(vi) The name of a pesticide which contains two or more principal active ingredients if the name suggests one or more but not all such principal active ingredients even though the names of the other ingredients are stated elsewhere in the labeling;

(vii) A true statement used in such a way as to give a false or misleading impression to the purchaser;

(viii) Label disclaimers which negate or detract from labeling statements required under the Act and these regulations;

(ix) Claims as to the safety of the pesticide or its ingredients, including statements such as "safe," "nonpoisonous," "noninjurious," "harmless" or "nontoxic to humans and pets" with or without such a qualifying phrase as "when used as directed"; and

(x) Non-numerical and/or comparative statements on the safety of the product, including but not limited to:

(A) "Contains all natural ingredients";

(B) "Among the least toxic chemicals known"

(C) "Pollution approved"

(6) *Final printed labeling.* (i) Except as provided in paragraph (a)(6)(ii) of this section, final printed labeling must be submitted and accepted prior to registration. However, final printed labeling need not be submitted until draft label texts have been provisionally accepted by the Agency.

(ii) Clearly legible reproductions or photo reductions will be accepted for unusual labels such as those silk-screened directly onto glass or metal containers or large bag or drum labels. Such reproductions must be of microfilm reproduction quality.

(b) *Name, brand, or trademark.* (1) The name, brand, or trademark under which the pesticide product is sold shall appear on the front panel of the label.

(2) No name, brand, or trademark may appear on the label which:

(i) Is false or misleading, or

(ii) Has not been approved by the Administrator through registration or supplemental registration as an additional name pursuant to § 162.6(b)(4).

(c) Name and address of producer, registrant, or person for whom produced. An unqualified name and address given on the label shall be considered as the name and address of the producer. If the registrant's name appears on the label and the registrant is not the producer, or if the name of the person for whom the pesticide was produced appears on the label, it must be qualified by appropriate wording such as "Packed for * * *," "Distributed by * * *," or "Sold by * * *" to show that the name is not that of the producer.

(d) *Net weight or measure of contents.* (1) The net weight or measure of content shall be exclusive of wrappers or other materials and shall be the average content unless explicitly stated as a minimum quantity.

(2) If the pesticide is a liquid, the net content statement shall be in terms of liquid measure at 68° F (20°C) and shall be expressed in conventional American units of fluid ounces, pints, quarts, and gallons.

(3) If the pesticide is solid or semisolid, viscous or pressurized, or is a mixture of liquid and solid, the net content statement shall be in terms of weight expressed as avoirdupois pounds and ounces.

(4) In all cases, net content shall be stated in terms of the largest suitable units, i.e., "1 pound 10 ounces" rather than "26 ounces."

(5) In addition to the required units specified, net content may be expressed in metric units.

(6) Variation above minimum content or around an average is permissible only to the extent that it represents deviation unavoidable in good manufacturing practice. Variation below a stated minimum is not permitted. In no case shall the average content of the packages in a shipment fall below the stated average content.

(e) *Product registration number.* The registration number assigned to the pesticide product at the time of registration shall appear on the label, preceded by the phrase "EPA Registration No.," or the phrase "EPA Reg. No." The registration number shall be set in type of a size and style similar to other print on that part of the label on which it appears and shall run parallel to it. The registration number and the required identifying phrase shall not appear in such a manner as to suggest or imply recommendation or endorsement of the product by the Agency.

(f) *Producing establishments registration number.* The producing establishment registration number preceded by the phrase "EPA Est.", of the final establishment at which the product was produced may appear in any suitable location on the label or immediate container. It must appear on the wrapper or outside container of the package if the EPA establishment registration number on the immediate container cannot be clearly read through such wrapper or container.

(g) *Ingredient statement*—(1) *General.* The label of each pesticide product must bear a statement which contains the name and percentage by weight of each active ingredient, the total percentage by weight of all inert ingredients; and if the pesticide contains arsenic in any form, a statement of the percentages of total and water-soluble arsenic calculated as elemental arsenic. The active ingredients must be designated by the term "active ingredients" and the inert ingredients by the term "inert ingredients," or the singular forms of these terms when appropriate. Both terms shall be in the same type size, be aligned to the same margin and be equally prominent. The statement "Inert Ingredients, none" is not required for pesticides which contain 100 percent active ingredients. Unless the ingredient statement is a complete analysis of the pesticide, the term "analysis" shall not be used as a heading for the ingredient statement.

(2) *Position of ingredient statement.* (i) The ingredient statement is normally required on the front panel of the label. If there is an outside container or wrapper through which the ingredient statement cannot be clearly read, the ingredient statement must also appear on such outside container or wrapper. If the size or form of the package makes it impracticable to place the ingredient statement on the front panel of the label, permission may be granted for the ingredient statement to appear elsewhere.

(ii) The text of the ingredient statement must run parallel with other text on the panel on which it appears, and must be clearly distinguishable from and must not be placed in the body of other text.

(3) *Names to be used in ingredient statement.* The name used for each ingredient shall be the accepted common name, if there is one, followed by the chemical name. The common name may be used alone only if it is well known. If no common name has been established, the chemical name alone shall be used. In no case will the use of a trademark or proprietary name be permitted unless such name has been accepted as a common name by the Administrator under the authority of Section 25(c)(6).

(4) *Statements of percentages.* The percentages of ingredients shall be stated in terms of weight-to-weight. The sum of percentages of the active and the inert ingredients shall be 100. Percentages shall not be expressed by a range of values such as "22-25%." If the uses of the pesticide product are expressed as weight of active ingredient per unit area, a statement of the weight of active ingredient per unit volume of the pesticide formulation shall also appear in the ingredient statement.

(5) *Accuracy of stated percentages.* The percentages given shall be as precise as possible reflecting good manufacturing practice. If there may be unavoidable variation between manufacturing batches, the value stated for each active ingredient shall be the lowest percentage which may be present.

(6) *Deterioration.* Pesticides which change in chemical composition significantly must meet the following labeling requirements:

(i) In cases where it is determined that a pesticide formulation changes chemical composition significantly, the product must bear the following statement in a prominent position on the label: "Not for sale or use after [date]."

(ii) The product must meet all label claims up to the expiration time indicated on the label.

(7) *Inert ingredients.* The Administrator may require the name of any inert ingredient(s) to be listed in the ingredient statement if he determines that such ingredient(s) may pose a hazard to man or the environment.

(h) *Warnings and precautionary statements.* Required warnings and precautionary statements concerning the general areas of toxicological hazard including hazard to children, environmental hazard, and physical or chemical hazard fall into two groups; those required on the front panel of the labeling and those which may appear elsewhere. Specific requirements concerning content, placement, type size, and prominence are given below.

(1) *Required front panel statements.* With the exception of the child hazard warning statement, the text required on the front panel of the label is determined by the Toxicity Category of the pesticide. The category is assigned on the basis of the highest hazard shown by any of the indicators in the table below:

Hazard indicators	Toxicity categories			
	I	II	III	IV
Oral LD$_{50}$	Up to and including 50 mg/kg.	From 50 thru 500 mg/kg	From 500 thru 5000 mg/kg.	Greater than 5000 mg/kg.
Inhalation LC$_{50}$	Up to and including .2 mg/liter.	From .2 thru 2 mg/liter	From 2. thru 20 mg/liter	Greater than 20 mg/liter.
Dermal LD$_{50}$	Up to and including 200 mg/kg.	From 200 thru 2000	From 2,000 thru 20,000	Greater than 20,000.
Eye effects	Corrosive; corneal opacity not reversible within 7 days.	Corneal opacity reversible within 7 days; irritation persisting for 7 days.	No corneal opacity; irritation reversible within 7 days.	No irritation.
Skin effects	Corrosive	Severe irritation at 72 hours.	Moderate irritation at 72 hours.	Mild or slight irritation at 72 hours.

(i) *Human hazard signal word*—(A) *Toxicity Category I.* All pesticide products meeting the criteria of Toxicity Category I shall bear on the front panel the signal word "Danger." In addition if the product was assigned to Toxicity Category I on the basis of its oral, inhalation or dermal toxicity (as distinct from skin and eye local effects) the word "Poison" shall appear in red on a background of distinctly contrasting color and the skull and crossbones shall appear in immediate proximity to the word "poison."

(B) *Toxicity Category II.* All pesticide products meeting the criteria of Toxicity Category II shall bear on the front panel the signal word "Warning."

(C) *Toxicity Category III.* All pesticide products meeting the criteria of Toxicity Category III shall bear on the front panel the signal word "Caution."

(D) *Toxicity Category IV.* All pesticide products meeting the criteria of Toxicity Category IV shall bear on the front panel the signal word "Caution."

(E) *Use of signal words.* Use of any signal word(s) associated with a higher Toxicity Category is not permitted except when the Agency determines that such labeling is necessary to prevent unreasonable adverse effects on man or the environment. In no case shall more than one human hazard signal word appear on the front panel of a label.

(ii) *Child hazard warning.* Every pesticide product label shall bear on the front panel the statement "keep out of reach of children." Only in cases where the likelihood of contact with children during distribution, marketing, storage or use is demonstrated by the applicant to be extremely remote, or if the nature of the pesticide is such that it is approved for use on infants or small children, may the Administrator waive this requirement.

(iii) *Statement of practical treatment*—(A) *Toxicity Category I.* A statement of practical treatment (first aid or other) shall appear on the front panel of the label of all pesticides falling into Toxicity Category I on the basis of oral, inhalation or dermal toxicity. The Agency may, however, permit reasonable variations in the placement of the statement of practical treatment is some reference such as "See statement of practical treatment on back panel" appears on the front panel near the word "Poison" and the skull and crossbones.

(B) *Other toxicity categories.* The statement of practical treatment is not required on the front panel except as described in paragraph (h)(1)(iii)(A) of this section. The applicant may, however, include such a front panel statement at his option. Statements of practical treatment are, however, required elsewhere on the label in accord with paragraph (h)(2) of this section if they do not appear on the front panel.

(iv) *Placement and prominence.* All the require front panel warning statements shall be grouped together on the label, and shall appear with sufficient prominence relative to other front panel text and graphic material to make them unlikely to be overlooked under customary conditions of purchase and use. The following table shows the minimum type size requirements for the front panel warning statements on various sizes of labels:

Size of label front panel in square inches	Points	
	Required signal word, all capitals	"Keep out of reach of children"
5 and under	6	6
Above 5 to 10	10	6
Above 10 to 15	12	8
Above 15 to 30	14	10
Over 30	18	12

(2) *Other required warnings and precautionary statements.* The warnings and precautionary statements as required below shall appear together on the label under the general heading "Precautionary Statements" and under appropriate subheadings of "Hazard to Humans and Domestic Animals," "Environmental Hazard" and "Physical or Chemical Hazard."

(i) *Hazard to humans and domestic animals.* (A) Where a hazard exists to humans or domestic animals, precautionary statements are required indicating the particular hazard, the route(s) of exposure and the precautions to be taken to avoid accident, injury or damage. The precautionary paragraph shall be immediately preceded by the appropriate hazard signal word.

(B) The following table depicts typical precautionary statements. These statements must be modified or expanded to reflect specific hazards.

Toxicity category	Precautionary statements by toxicity category	
	Oral, inhalation, or dermal toxicity	Skin and eye local effects
I	Fatal (poisonous) if swallowed [inhaled or absorbed through skin]. Do not breathe vapor [dust or spray mist]. Do not get in eyes, on skin, or on clothing [Front panel statement of practical treatment required.].	Corrosive, causes eye and skin damage [or skin irritation]. Do not get in eyes, on skin, or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful or fatal if swallowed. [Appropriate first aid statement required.]
II	May be fatal if swallowed [inhaled or absorbed through the skin]. Do not breathe vapors [dust or spray mist]. Do not get in eyes, on skin, or on clothing. [Appropriate first aid statements required.].	Causes eye [and skin] irritation. Do not get in eyes, on skin, or on clothing. Harmful if swallowed. [Appropriate first aid statement required.]
III	Harmful if swallowed [inhaled or absorbed through the skin]. Avoid breathing vapors [dust or spray mist]. Avoid contact with skin [eyes or clothing]. [Appropriate first aid statement required.].	Avoid contact with skin, eyes or clothing. In case of contact immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists.
IV	[No precautionary statements required.]	[No precautionary statements required.]

(ii) *Environmental hazards.* Where a hazard exists to non target organisms excluding humans and domestic animals, precautionary statements are required stating the nature of the hazard and the appropriate precautions to avoid potential accident, injury or damage. Examples of the hazard statements and the circum-

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stances under which they are required follow:

(A) If a pesticide intended for outdoor use contains an active ingredient with a mammalian acute oral LD_{50} of 100 or less, the statement "This Pesticide is Toxic to Wildlife" is required.

(B) If a pesticide intended for outdoor use contains an active ingredient with a fish acute LC_{50} of 1 ppm or less, the statement "This Pesticide is Toxic to Fish" is required.

(C) If a pesticide intended for outdoor use contains an active ingredient with an avian acute oral LD_{50} of 100 mg/kg or less, or a subacute dietary LC_{50} of 500 ppm or less, the statement "This Pesticide is Toxic to Wildlife" is required.

(D) If either accident history or field studies demonstrate that use of the pesticide may result in fatality to birds, fish or mammals, the statement "This pesticide is extremely toxic to wildlife (fish)" is required.

(E) For uses involving foliar application to agricultural crops, forests, or shade trees, or for mosquito abatement treatments, pesticides toxic to pollinating insects must bear appropriate label cautions.

(F) For all outdoor uses other than aquatic applications the label must bear the caution "Keep out of lakes, ponds or streams. Do not contaminate water by cleaning of equipment or disposal of wastes."

(iii) *Physical or chemical hazards.* Warning statements on the flammability or explosive characteristics of the pesticide are required as follows:

Flash point	Required text
(A) PRESSURIZED CONTAINERS	
Flash point at or below 20° F; if there is a flashback at any valve opening.	Extremely flammable. Contents under pressure. Keep away from fire, sparks, and heated surfaces. Do not puncture or incinerate container. Exposure to temperatures above 130° F may cause bursting.
Flash point above 20° F and not over 80° F or if the flame extension is more than 18 in long at a distance of 6 in from the flame.	Flammable. Contents under pressure. Keep away from heat, sparks, and open flame. Do not puncture or incinerate container. Exposure to temperatures above 130° F may cause bursting.
All other pressurized containers	Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130° F may cause bursting.
(B) NONPRESSURIZED CONTAINERS	
At or below 20° F	Extremely flammable. Keep away from fire, sparks, and heated surfaces.
Above 20° F and not over 80° F	Flammable. Keep away from heat and open flame.
Above 80° F and not over 150° F	Do not use or store near heat or open flame.

(i) *Directions for Use*—(1) *General requirements*—(i) *Adequacy and clarity of directions.* Directions for use must be stated in terms which can be easily read and understood by the average person likely to use or to supervise the use of the pesticide. When followed, directions must be adequate to protect the public from fraud and from personal injury and to prevent unreasonable adverse effects on the environment.

(ii) *Placement of directions for use.* Directions may appear on any portion of the label provided that they are conspicuous enough to be easily read by the user of the pesticide product. Directions for use may appear on printed or graphic matter which accompanies the pesticide provided that:

(A) If required by the Agency, such printed or graphic matter is securely attached to each package of the pesticide, or placed within the outside wrapper or bag;

(B) The label bears a reference to the directions for use in accompanying leaflets or circulars, such as "See directions in the enclosed circular:" and

(C) The Administrator determines that it is not necessary for such directions to appear on the label.

(iii) *Exceptions to requirement for direction for use*—(A) Detailed directions for use may be omitted from labeling of pesticides which are intended for use only by manufacturers of products other than pesticide products in their regular manufacturing processes, provided that:

(*1*) The label clearly shows that the product is intended for use only in manufacturing processes and specifies the type(s) of products involved.

(*2*) Adequate information such as technical data sheets or bulletins, is available to the trade specifying the type of product involved and its proper use in manufacturing processes;

(*3*) The product will not come into the hands of the general public except after incorporation into finished products; and

(*4*) The Administrator determines that such directions are not necessary to prevent unreasonable adverse effects on man or the environment.

(B) Detailed directions for use may be omitted from the labeling of pesticide products for which sale is limited to physicians, veterinarians, or druggists, provided that:

(*1*) The label clearly states that the product is for use only by physicians or veterinarians;

(*2*) The Administrator determines that such directions are not necessary to prevent unreasonable adverse effects on man or the environment; and

(*3*) The product is also a drug and regulated under the provisions of the Federal Food, Drug and Cosmetic Act.

(C) Detailed directions for use may be omitted from the labeling of pesticide products which are intended for use only by formulators in preparing pesticides for sale to the public, provided that:

(*1*) There is information readily available to the formulators on the composition, toxicity, methods of use, applicable restrictions or limitations, and effectiveness of the product for pesticide purposes;

(*2*) The label clearly states that the product is intended for use only in manufacturing, formulating, mixing, or repacking for use as a pesticide and specifies the type(s) of pesticide products involved;

(*3*) The product as finally manufactured, formulated, mixed, or repackaged is registered; and

(*4*) The Administrator determines that such directions are not necessary to prevent unreasonable adverse effects on man or the environment.

(2) *Contents of Directions for Use.* The directions for use shall include the following, under the headings "Directions for Use":

(i) The statement of use classification as prescribed in 162.10(j) immediately under the heading "Directions for Use."

(ii) Immediately below the statement of use classification, the statement "It is a violation of Federal law to use this product in a manner inconsistent with its labeling."

(iii) The site(s) of application, as for example the crops, animals, areas, or objects to be treated.

(iv) The target pest(s) associated with each site.

(v) The dosage rate associated with each site and pest.

(vi) The method of application, including instructions for dilution, if required, and type(s) of application apparatus or equipment required.

(vii) The frequency and timing of applications necessary to obtain effective results without causing unreasonable adverse effects on the environment.

(viii) Specific limitations on reentry to areas where the pesticide has been applied, meeting the requirements concerning reentry provided by 40 CFR Part 170.

(ix) Specific directions concerning the storage and disposal of the pesticide and its container, meeting the requirements of 40 CFR Part 165. These instructions shall be grouped and appear under the heading "Storage and Disposal." This heading must be set in type of the same minimum sizes as required for the child hazard warning. (See Table in § 162.10(h)(1)(iv))

(x) Any limitations or restrictions on use required to prevent unreasonable adverse effects, such as:

(A) Required intervals between application and harvest of food or feed crops.

(B) Rotational crop restrictions.

(C) Warnings as required against use on certain crops, animals, objects, or in or adjacent to certain areas.

(D) [Reserved]

(E) For restricted use pesticides, a statement that the pesticide may be applied under the direct supervision of a certified applicator who is not physically present at the site of application but nonetheless available to the person applying the pesticide, unless the Agency has determined that the pesticide may only be applied under the direct supervision of a certified applicator who is physically present.

(F) Other pertinent information which the Administrator determines to be necessary for the protection of man and the environment.

(j) *Statement of Use Classification.* By October 22, 1976, all pesticide products must bear on their labels a statement of use classification as described in paragraphs (j) (1) and (2) of this section. Any pesticide product for which some uses are classified for general use and others for restricted use shall be separately labeled according to the labeling standards set forth in this subsection, and shall be marketed as separate products with differen registration numbers, one bearing directions only for general use(s) and the other bearing directions for restricted use(s) except that, if a product has both restricted use(s) and general use(s), both of these uses may appear on a product labeled for restricted use. Such products shall be subject to the provisions of § 162.10(j)(2).

(1) *General Use Classification.* Pesticide products bearing directions for use(s) classified general shall be labeled with the exact words "General Classification" immediately below the heading "Directions for Use." And reference to the general classification that suggests or implies that the general utility of the pesticide extends beyond those purposes and uses contained in the Directions for Use will be considered a false or misleading statement under the statutory definitions of misbranding.

(2) *Restricted Use Classification.* Pesticide products bearing direction for use(s) classified restricted shall bear statements of restricted use classification on the front panel as described below:

(i) *Front panel statement of restricted use classification.* (A) At the top of the front panel of the label, set in type of the same minimum sizes as required for human hazard signal words (see table in § 162.10(h)(1)(iv)), and appearing with sufficient prominence relative to other text and graphic material on the front panel to make it unlikely to be overlooked under customary conditions of purchase and use, the statement "Restricted Use Pesticide" shall appear.

(B) Directly below this statement on the front panel, a summary statement of the terms of restriction imposed as a precondition to registration shall appear. If use is restricted to certified applicators, the following statement is required: "For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification." If, however, other regulatory restrictions are imposed, the Administrator will define the appropriate wording for the terms of restriction by regulation.

(k) Advertising. [Reserved]

[40 FR 28268, July 3, 1975; 40 FR 32329, Aug. 1, 1975; 40 FR 36571, Aug. 21, 1975, as amended at 43 FR 5786, Feb. 9, 1978]

PHYS/CHEM-1

PHYSICAL/CHEMICAL HAZARDS

Criteria	Required Label Statement
I. Pressurized Containers	
A. Flashpoint at or below 20°F; or if there is a flashback at any valve opening.	Extremely flammable. Contents under pressure. Keep away from fire, sparks, and heated surfaces. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.
B. Flashpoint above 20°F and not over 80°F; or if the flame extension is more than 18 inches long at a distance of 6 inches from the valve opening.	Flammable. Contents under pressure. Keep away from heat, sparks, and flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.
C. All Other Pressurized Containers	Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.
II. Non-Pressurized Containers	
A. Flashpoint at or below 20°F.	Extremely flammable. Keep away from fire, sparks, and heated surfaces.
B. Flashpoint above 20°F and not over 80°F.	Flammable. Keep away from heat and open flame.
C. Flashpoint over 80°F and not over 150°F.	Do not use or store near heat and open flame.
D. Flashpoint above 150°F.	None required.

STOR-1

STORAGE INSTRUCTIONS FOR PESTICIDES

Heading:

All products are required to bear specific label instructions about storage and disposal. Storage and disposal instructions must be grouped together in the directions for use portion of the label under the heading STORAGE AND DISPOSAL. Products intended solely for domestic use need not include the heading "STORAGE AND DISPOSAL."

Storage Instructions:

All product labels are required to have appropriate storage instructions. Specific storage instructions are not prescribed. Each registrant must develop his own storage instructions, considering, when applicable, the following factors:

1. Conditions of storage that might alter the composition or usefulness of the pesticide. Examples could be temperature extremes, excessive moisture or humidity, heat, sunlight, friction, or contaminating substances or media.

2. Physical requirements of storage which might adversely affect the container of the product and its ability to continue to function properly. Requirements might include positioning of the container in storage, storage or damage due to stacking, penetration of moisture, and ability to withstand shock or friction.

3. Specifications for handling the pesticide container, including movement of container within the storage area, proper opening and closing procedures (particularly for opened containers), and measures to minimize exposure while opening or closing container.

4. Instructions on what to do if the container is damaged in any way, or if the pesticide is leaking or has been spilled, and precautions to minimize exposure if damage occurs.

5. General precautions concerning locked storage, storage in original container only, and separation of pesticides during storage to prevent cross-contamination of other pesticides, fertilizer, food, and feed.

6. General storage instructions for household products should emphasize storage in original container and placement in locked storage areas.

CONTAINER DISPOSAL INSTRUCTIONS

The label of each product must bear container disposal instructions appropriate to the type of container.

1. Domestic use products must bear one of the following container disposal statements:

Container Type	Statement
Non-aerosol products (bottles, cans, jars)	Do not reuse container (bottle, can, jar). Rinse thoroughly before discarding in trash.
Non-aerosol products (bags)	Do not reuse bag. Discard bag in trash.
Aerosol products	Replace cap and discard containers in trash. Do not incinerate or puncture.

2. All other products must bear container disposal instructions, based on container type, listed below:

Container Type	Statement
Metal containers (non-aerosol)	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.
Plastic containers	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.
Glass containers	Triple rinse (or equivalent). Then dispose of in a sanitary landfill or by other approved state and local procedures.
Fiber drums with liners	Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by state and local authorities. If drum is contaminated and cannot be reused[1], dispose of in the same manner.
Paper and plastic bags	Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.
Compressed gas cylinders	Return empty cylinder for reuse (or similar wording)

[1] Manufacturer may replace this phrase with one indicating whether and how fiber drum may be reused.

APPENDIX III

USE INDEX APPENDIX

FINAL
SAI/MAI
022703

COPPER AMMONIUM CARBONATE

TYPE PESTICIDE: Fungicide

FORMULATIONS:
FI (8%)
FlC (0.77 lb/gal or 8%)
SC/L (0.77 lb/gal or 8%, 0.784 lb/gal or 8%, 0.934 lb/gal or 10%)

GENERAL WARNINGS AND LIMITATIONS: Apply immediately after preparation. May be corrosive to aluminum, brass, bronze and copper after long periods of contact. Dosage rates and formulations are given in metallic copper equivalent.

Definition of Terms:
MAI - Multiple active ingredient.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations

TERRESTRIAL FOOD CROP

(Agricultural Crops)

General Warnings and Limitations: With dilute ground equipment, apply specified rate in 10 to 60 gallons of water per acre for vegetable or field crops, or 100 to 800 gallons per acre for orchards (use 500 to 2,000 gallons for citrus). For concentrate spraying, apply in not less than 5 gallons per acre or 20 to 100 gallons per acre for orchards. Apply 3 to 20 gallons per acre by aircraft.

/03001AA	Almond		Exempt Do not apply later than bud swell through 2.31 pounds per 100 gallons.
FBADMCB	Brown rot blossom and twig blight (Monilinia)	1.54-2.31 lb/A or 1.54-2.31 lb/ 100 gal (0.77 lb/gal or 8% SC/L)	Delayed dormant application. Apply at bud swell stage. Dormant oil may be used.

COPPER AMMONIUM CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/05001AA	Apricot		Exempt Do not apply later than jacket fall through 2.31 pounds per 100 gallons.
FBADMCB	Brown rot blossom and twig blight (Monilinia)	1.54-2.31 lb/A or 1.54-2.31 lb/ 100 gal (0.77 lb/gal or 8% SC/L)	Delayed dormant and foliar application. Apply at red bud to jacket fall stage.
/28001AA	Beans		Exempt No preharvest interval through 0.58 pound per acre.
FBAAXAA FBARPDZ	Bacterial (common) blight (Xanthomonas) Bacterial halo blight (Pseudomonas)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) --OR MAI-- 0.26-0.58 lb/A (0.77 lb/gal or 8% F1C)	Foliar application. Apply when plants are 3 to 5 inches high and before disease appears. Repeat at 7 to 10 day intervals or 5 to 7 days under severe conditions. OR MAI Formulated with sulfur.
/28073AA	Carrots		Exempt No preharvest interval through 0.58 pound per acre.
FBAMCBM FBASAAX	Early blight (Cercospora) Late blight (Alternaria)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) --OR MAI-- 0.26-0.58 lb/A (0.77 lb/gal or 8% F1C)	Foliar application. Apply when plants are 6 inches high. Apply 3 to 10 times at 7 to 10 day intervals. OR MAI Formulated with sulfur.

COPPER AMMONIUM CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28003AA	Celery		Exempt No preharvest interval through 0.58 pound per acre.
FBAMCBM	Early blight (Cercospora)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) --OR MAI-- 0.26-0.58 lb/A (0.77 lb/gal or 8% FlC)	Foliar application. Apply 4 to 7 times at weekly intervals. OR MAI Formulated with sulfur.
FBASSBL	Late blight (Septoria)		
/02000AA	Citrus Fruits		Exempt Apply through 3.85 pounds per acre in accordance with directions below.
FMAYMCA	Greasy spot (Mycosphaerella)	1.28-2.31 lb/A or 0.58-0.776 lb/500 gal (0.77 lb/gal or 8% SC/L) or 0.098 lb/15 gal (0.784 lb/gal or 8% SC/L) or 1.925-3.85 lb/A (0.77 lb/gal or 8% SC/L)	Use limited to FL. Foliar application. Apply at post-bloom and within 1 month after any leaf expansion of any growth flush. Do not apply with oil.
FIBLDAP	Melanose (Diaporthe)	1.925-3.85 lb/A or 0.58-0.776 lb/500 gal (0.77 lb/gal or 8% SC/L) or	Foliar application. Apply 1 to 3 weeks after bloom. Dosage rate depends upon disease severity.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Citrus Fruits (continued)		
		0.47 lb/A (0.934 lb/gal or 10% SC/L)	
FAABEAH	Scab (spot anthracnose) (Elsinoe)	0.58-0.77 lb/500 gal or 2.31-3.08 lb/A [aircraft] (0.77 lb/gal or 8% SC/L)	Foliar application. Make 2 applications. Apply just before the trees begin to flush and again when two-thirds of the petals have fallen.
/10000AA	Cucurbits (Cantaloupe, Cucumber, Melons, Squash)		Exempt No preharvest interval through 0.58 pound per acre.
FBATAAX	Alternaria leaf blight	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) or 0.098 lb/15 gal (0.784 lb/gal or 8% SC/L) --OR MAI-- 0.26-0.58 lb/A (0.77 lb/gal or 8% F1C)	Foliar application. Apply beginning after vining (or after emergence for melons) and repeat until midharvest. Be certain to spray underside of leaves. OR MAI Formulated with sulfur.
FMABPDZ	Angular leaf spot (Pseudomonas)		
FFABPEA	Downy mildew (Pseudoperonospora)		
FFACEBJ	Powdery mildew (Erysiphe)		
FEAJCCV	Scab (Cladosporium)		
/01014AA	Grapes		Exempt 2 week preharvest interval through 0.58 pound per acre. Add 4 pounds of hydrated lime to all sprays.
FEAAEAH	Anthracnose (Elsinoe)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) or	Foliar application. Apply when leaves first appear, just after blooming, and then at 2 week intervals. OR MAI Formulated with sulfur.

COPPER AMMONIUM CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Grapes (continued)		
		—OR MAI— 0.26-0.58 lb/A (0.77 lb/gal or 8% F1C)	
FIBFGBG FFABPCV	Black rot (Guignardia) Downy mildew (Plasmopara)	0.47 lb/A (0.934 lb/gal or 10% SC/L)	Foliar application. Apply when leaves first appear, before blossoms open, after petal fall, and at 2 week intervals.
/05003AA /05004AA	Nectarine Peach		Exempt Do not apply at or after full bloom through 2.31 pounds per acre.
FBADMCB	Brown rot blossom and twig blight (Monilinia)	1.54-2.31 lb/A (0.77 lb/gal or 8% SC/L)	Dormant or delayed dormant application. May be applied with dormant oil.
FEAGTAB	Leaf curl (Taphrina)	1.54-2.31 lb/A (0.77 lb/gal or 8% SC/L)	Dormant application. Apply at leaf fall or before bud swell.
	Peach	See Nectarine cluster.	
/28015AA	Peanuts		Exempt No preharvest interval through 0.58 pound per acre.
FMBCCBM	Cercospora leaf spot	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) —OR MAI— 0.26-0.58 lb/A (0.77 lb/gal or 8% F1C)	Foliar application. Apply when disease appears. Apply 4 to 8 times at 10 to 14 day intervals. OR MAI Formulated with sulfur.

COPPER AMMONIUM CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28017AA	Peppers		Exempt No preharvest interval through 0.58 pound per acre.
FMAAXAA FMBCCBM	Bacterial spot (Xanthomonas) Leaf spot (Cercospora)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) --OR MAI-- 0.26-0.58 lb/A (0.77 lb/gal or 8% FlC)	Foliar application. Apply at emergence in plant beds or before the disease appears. Apply in the field after transplanting or emergence. Repeat at 7 to 10 day intervals or at 4 to 5 days if disease is severe. OR MAI Formulated with sulfur.
/14013AA	Potato		Exempt No preharvest interval through 0.58 pound per acre.
FBAMAAX FBASPCN	Early blight (Alternaria) Late blight (Phytophthora)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) --OR MAI-- 0.26-0.58 lb/A (0.77 lb/gal or 8% FlC)	Foliar application. Apply when or before disease appears. Apply 4 to 6 times at 7 to 10 day intervals. OR MAI Formulated with sulfur.
/28023AA	Soybeans		Exempt No preharvest interval through 0.51 pound per acre.
FBAAPDZ	Bacterial blight (Pseudomonas)	0.34-0.51 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L)	Foliar application. Apply when plants are 3 to 5 inches high and before disease appears. Repeat at 7 to 10 day intervals or 5 to 7 days when severe conditions are present.

COPPER AMMONIUM CARBONATE

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number

TERRESTRIAL FOOD CROP

(Agricultural Crops)

/03001AA **Almond**
FBADMCB Brown rot blossom and twig blight (Monilinia)
(0.77 lb/gal or 8% SC/L)
007001-00251 010465-00003

/05001AA **Apricot**
FBADMCB Brown rot blossom and twig blight (Monilinia)
(0.77 lb/gal or 8% SC/L)
007001-00251 010465-00003

/28001AA **Beans**
FBAAXAA Bacterial (common) blight (Xanthomonas)
FBARPDZ Bacterial halo blight (Pseudomonas)
(0.77 lb/gal or 8% F1C)
007001-00334 010465-00002 010465-00004

(0.77 lb/gal or 8% SC/L)
007001-00251 009159-00088 010465-00001 010465-00003

(0.934 lb/gal or 10% SC/L)
011503-00001

/28073AA **Carrots**
FBAMCBM Early blight (Cercospora)
FBASAAX Late blight (Alternaria)
(0.77 lb/gal or 8% F1C)
007001-00334 010465-00002 010465-00004

(0.77 lb/gal or 8% SC/L)
007001-00251 009159-00088 010465-00001 010465-00003

(0.934 lb/gal or 10% SC/L)
011503-00001

/28003AA **Celery**
FBAMCBM Early blight (Cercospora)
FBASSBL Late blight (Septoria)
(0.77 lb/gal or 8% F1C)
007001-00334 010465-00002 010465-00004

(0.77 lb/gal or 8% SC/L)
007001-00251 009159-00088 010465-00001 010465-00003

(0.934 lb/gal or 10% SC/L)
011503-00001

Listing of Registered Pesticide Products by Formulation

&208.0002 8% formulation intermediate
copper ammonium carbonate (022703)
010143-00002

&208.0014 8% (0.77 lb/gal) flowable concentrate
copper ammonium carbonate (022703) plus sulfur (077501))
007001-00334 010465-00002 010465-00004 010659-00013

&208.0015 8% (0.77 lb/gal) soluble concentrate/liquid
copper ammonium carbonate (022703)
007001-00251 009159-00088 010465-00001 010465-00003

&208.0015 8% (0.784 lb/gal) soluble concentrate/liquid
copper ammonium carbonate (022703)
000557-01883

&210.0015 10% (0.934 lb/gal) soluble concentrate/liquid
copper ammonium carbonate (022703)
011503-00001

COPPER AMMONIUM CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Tomato (continued)		
		0.098 lb/15 gal (0.784 lb/gal or 8% SC/L)	
		—OR MAI—	
		0.26-0.58 lb/A (0.77 lb/gal or 8% FlC)	
/03009AA	Walnut		Exempt No preharvest interval through 2.31 pound per acre.
FBAAXAA	Walnut blight (Xanthomonas)	1.925-2.31 lb/A (0.77 lb/gal or 8% SC/L)	Delayed dormant and foliar application. Apply at early prebloom and again at late prebloom. Additional applications can be made if the disease persists.
	AERIAL AND TANK MIX APPLICATION		
9001500 AAAAAAA	Aerial Application		
	--	Refer to TERRESTRIAL FOOD CROP (Agricultural Crops) All Sites	

COPPER AMMONIUM CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/01016AA	Strawberry		Exempt No preharvest interval through 0.58 pound per acre.
FMBCMCO FGAKDBS	Leaf spot (Mycosphaerella) Leaf scorch (Diplocarpon)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L)	Delayed dormant and foliar application. Apply as soon as new growth starts and repeat at 7 to 10 day intervals. OR MAI Formulated with sulfur.
		—OR MAI—	
		0.26-0.58 lb/A (0.77 lb/gal or 8% FlC)	
/28020AA	Sugar Beets		Exempt No preharvest interval through 0.58 pound per acre.
FMBCCBM	Leaf spot (Cercospora)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L)	Foliar application. Apply when disease appears. Apply 3 to 6 times at 10 to 14 day intervals. OR MAI Formulated with sulfur.
		—OR MAI—	
		0.26-0.58 lb/A (0.77 lb/gal or 8% FlC)	
/11005AA	Tomato		Exempt No preharvest interval through 0.58 pound per acre.
FMAAXAA FBAMAAX FBASPCN	Bacterial spot (Xanthomonas) Early blight (Alternaria) Late blight (Phytophthora)	0.26-0.58 lb/A (0.77 lb/gal or 8% SC/L) (0.934 lb/gal or 10% SC/L) or	Foliar application. Apply in plant beds at emergence at 4 to 5 day intervals. In field begin immediately after transplanting or emergence. In areas where the disease is less severe, the interval can be 5 to 7 days. OR MAI Formulated with sulfur.

COPPER AMMONIUM CARBONATE

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/02000AA	Citrus Fruits
FMAYMCA	Greasy spot (Mycosphaerella)
FIBLDAP	Melanose (Diaporthe)
FAABEAH	Scab (spot anthracnose) (Elsinoe)
	(0.77 lb/gal or 8% SC/L)
	007001-00251 010465-00001 010465-00003
	(0.784 lb/gal or 8% SC/L)
	000557-01883
	(0.934 lb/gal or 10% SC/L)
	011503-00001
/10000AA	Cucurbits (Cantaloupe, Cucumber, Melons, Squash)
FBATAAX	Alternaria leaf blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFABPEA	Downy mildew (Pseudoperonospora)
FFACEBJ	Powdery mildew (Erysiphe)
FEAJCCV	Scab (Cladosporium)
	(0.77 lb/gal or 8% FlC)
	007001-00334 010465-00002 010465-00004
	(0.77 lb/gal or 8% SC/L)
	007001-00251 009159-00088 010465-00001 010465-00003
	(0.784 lb/gal or 8% SC/L)
	000557-01883
	(0.934 lb/gal or 10% SC/L)
	011503-00001
/01014AA	Grapes
FEAAEAH	Anthracnose (Elsinoe)
FIBFGBG	Black rot (Guignardia)
FFABPCV	Downy mildew (Plasmopara)
	(0.77 lb/gal or 8% FlC)
	007001-00334 010465-00002 010465-00004
	(0.77 lb/gal or 8% SC/L)
	007001-00251 009159-00088 010465-00001 010465-00003
	(0.934 lb/gal or 10% SC/L)
	011503-00001
/05003AA	Nectarine
FBADMCB	Brown rot blossom and twig blight (Monilinia)
FEAGTAB	Leaf curl (Taphrina)
	(0.77 lb/gal or 8% SC/L)
	007001-00251 010465-00003

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/05004AA Peach
FBADMCB Brown rot blossom and twig blight (Monilinia)
FEAGTAB Leaf curl (Taphrina)
(0.77 lb/gal or 8% SC/L)
007001-00251 010465-00003

/28015AA Peanuts
FMBCCBM Cercospora leaf spot
(0.77 lb/gal or 8% F1C)
007001-00334 010465-00002 010465-00004 010659-00013

(0.77 lb/gal or 8% SC/L)
007001-00251 009159-00088 010465-00001 010465-00003

(0.934 lb/gal or 10% SC/L)
011503-00001

/28017AA Peppers
FMAAXAA Bacterial spot (Xanthomonas)
FMBCCBM Leaf spot (Cercospora)
(0.77 lb/gal or 8% F1C)
007001-00334 010465-00002 010465-00004

(0.77 lb/gal or 8% SC/L)
007001-00251 009159-00088 010465-00001 010465-00003

(0.934 lb/gal or 10% SC/L)
011503-00001

/14013AA Potato
FBAMAAX Early blight (Alternaria)
FBASPCN Late blight (Phytophthora)
(0.77 lb/gal or 8% F1C)
007001-00334 010465-00002 010465-00004

(0.77 lb/gal or 8% SC/L)
007001-00251 009159-00088 010465-00001 010465-00003

(0.934 lb/gal or 10% SC/L)
011503-00001

/28023AA Soybeans
FBAAPDZ Bacterial blight (Pseudomonas)
(0.77 lb/gal or 8% SC/L)
007001-00251 010465-00003

(0.934 lb/gal or 10% SC/L)
011503-00001

/01016AA	Strawberry
FMBCMCO	Leaf spot (Mycosphaerella)
FGAKDBS	Leaf scorch (Diplocarpon)
	(0.77 lb/gal or 8% F1C)
	007001-00334 010465-00002 010465-00004
	(0.77 lb/gal or 8% SC/L)
	007001-00251 009159-00088 010465-00001 010465-00003
	(0.934 lb/gal or 10% SC/L)
	011503-00001
/28020AA	Sugar Beets
FMBCCBM	Leaf spot (Cercospora)
	(0.77 lb/gal or 8% F1C)
	007001-00334 010465-00002 010465-00004
	(0.77 lb/gal or 8% SC/L)
	007001-00251 009159-00088 010465-00001 010465-00003
	(0.934 lb/gal or 10% SC/L)
	011503-00001
/11005AA	Tomato
FMAAXAA	Bacterial spot (Xanthomonas)
FBAMAAX	Early blight (Alternaria)
FBASPCN	Late blight (Phytophthora)
	(0.77 lb/gal or 8% F1C)
	007001-00334 010465-00002 010465-00004
	(0.77 lb/gal or 8% SC/L)
	007001-00251 009159-00088 010465-00001 010465-00003
	(0.784 lb/gal or 8% SC/L)
	000557-01883
	(0.934 lb/gal or 10% SC/L)
	011503-00001
/03009AA	Walnut
FBAAXAA	Walnut blight (Xanthomonas)
	(0.77 lb/gal or 8% SC/L)
	007001-00251 010465-00003

FINAL
SAI/MAI
c022702

COPPER (IN THE FORM OF AN AMMONIA COMPLEX)

TYPE PESTICIDE: Fungicide

FORMULATIONS:
SC/L (0.8%, 0.8 lb/gal or 8%)
RTU (4.3%)

GENERAL WARNINGS AND LIMITATIONS: Avoid contact with skin and eyes. In case of skin contact, remove with washing; for eyes, wash with copious amounts of water and get immediate medical attention.
Dosages and formulations are given in metallic copper equivalent.
Agricultural Crop Tolerances: Exempt

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL FOOD CROP		
	(Agricultural Crops)		
	General Warnings and Limitations: For dilute, high volume sprays, use from 25 to 100 gallons per acre. For concentrate ground sprays, apply 20 to 50 gallons per acre. For aerial spraying, use 3 to 15 gallons per acre.		
/28001AA	Beans		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
FBAFXAV	Bacterial blight (common) (Xanthomonas)	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Make first application when plants are 3 to 5 inches high before disease symptoms appear. Continue applications on a 7 to 10 day schedule, depending on local conditions.
FBZRPGG	Halo blight (Pseudomonas)		
/10002AA	Cantaloupe		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
/10005AA	Honeydew Melons		
/10006AA	Muskmelons		
/10008AA	Watermelons		
FBAAAAX	Alternaria blight	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Apply when plants begin to vine. Continue applications on a weekly basis. In areas where angular leaf spot is a problem, applications should be made on a 5 to 7 day schedule.
FMABPDZ	Angular leaf spot (Pseudomonas)		
FFABPEA	Downy mildew (Pseudoperonospora)		
FFACSCO	Powdery mildew (Sphaerotheca)		
FEAJCCV	Scab (Cladosporium)		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28003AA	Celery		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
FBZAPDZ	Bacterial blight (Pseudomonas)	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Begin application when plants are first established, then every 7 days depending on disease conditions.
FBAMCBM	Early blight (Cercospora)		
FBASSBL	Late blight (Septoria)		
/10010AA	Cucumber		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
/10013AA	Squash (Summer)		
/10014AA	Squash (Winter)		
FBAAAAX	Alternaria blight	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Apply when plants begin to vine. Continue applications on a weekly basis. In areas where angular leaf spot is a problem, applications should be made on a 5 to 7 day schedule.
FMABPDZ	Angular leaf spot (Pseudomonas)		
FFACSCO	Powdery mildew (Sphaerotheca)		
	Honeydew Melons		See Cantaloupe cluster.
	Muskmelons		See Cantaloupe cluster.
/28015AA	Peanuts		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
FMBCCBM	Cercospora leaf spot	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Apply at the first sign of disease and every 10 to 14 days thereafter.
/28017AA	Peppers		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
FMZAXAA	Bacterial spot (Xanthomonas)	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Apply before disease appears and continue at 7 to 10 day intervals.
FMBCCBM	Cercospora leaf spot		

COPPER (IN THE FORM OF AN AMMONIA COMPLEX)

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/14013AA	Potato		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
FBAMAAX FBASPCN	Early blight (Alternaria) Late blight (Phytophthora)	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Begin application when plants are 3 to 4 inches high and continue at 7 to 10 day intervals.
/28023AA	Soybeans		Exempt No preharvest interval through 0.48 pound copper (metallic equivalent) per acre.
FBZAPDZ	Bacterial blight (Pseudomonas)	0.376-0.48 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Make first application when plants are 3 to 5 inches high before disease symptoms appear. Continue applications on a 7 to 10 day schedule, depending on local conditions.
	Squash (Summer)		See Cucumber cluster.
	Squash (Winter)		See Cucumber cluster.
/28020AA	Sugar Beets		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
FMBCCBM	Cercospora leaf spot	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. Apply when plants are 3 to 4 inches high and continue on a 10 to 14 day interval or more frequent if disease conditions are severe.
/11005AA	Tomato		Exempt No preharvest interval through 0.6 pound copper (metallic equivalent) per acre.
FMZAXBA FBAMAEP	Bacterial spot (Xanthomonas) Early blight (Alternaria)	0.264-0.6 lb/A (0.8 lb/gal or 8% SC/L)	Foliar application. In seed beds, begin applications when seedlings emerge and repeat at 4 to 5 day intervals. In field, begin applications immediately after transplanting and continue on 7 day intervals or more frequently if disease conditions are severe.

COPPER (IN THE FORM OF AN AMMONIA COMPLEX)

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/03009AA	Walnut		Exempt No preharvest interval through 2.4 pounds copper (metallic equivalent) per acre.
FBZAXAA	Walnut blight (Xanthomonas)	2.0-2.4 lb/A (0.8 lb/gal or 8% SC/L)	Delayed dormant and foliar application. Make first and second applications at early and late prebloom respectively. If disease conditions persist, make additional applications.
	Watermelons		See Cantaloupe cluster.
	TERRESTRIAL NON-FOOD CROP		
	(Ornamental Plants and Forest Trees)		
/31065AA	Chrysanthemum		
/31129AA	Delphinium		
/31121AA	Hollyhock		
/31156AA	Phlox		
/34120AA	Rose		
/31197AA	Sweet Pea		
FFACQBB	Powdery mildew	2.0 tbls 0.8% SC/L/gal (0.8% SC/L)	Foliar application. Apply spray to upper and lower surfaces of the foliage every 3 to 5 days depending on the severity of infection. Repeat after rains. Apply every 10 days as a preventive treatment. For phlox, apply from early growth until bloom.
	INDOOR		
	(Wood or Wood Structure Protection Treatments)		
/64002NA	Wood Protection Treatment (Seasoned Forest Products)		
FYAEQBB	Wood rot/decay	— (4.3% RTU)	Wood protection treatment. Apply several coats with brush or rag mop to all surfaces of previously pressure treated lumber exposed by cutting, notching, and dapping. Formulated with ammonium arsenate.

COPPER (IN THE FORM OF AN AMMONIA COMPLEX)

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	AERIAL AND TANK MIX APPLICATIONS		
9001500 AAAAAAA	Aerial Application --	Refer to TERRESTRIAL FOOD CROP (Agricultural Crops) All Sites	

COPPER (IN THE FORM OF AN AMMONIA COMPLEX)

Listing of Registered Pesticide Products by Formulation

&200.8015 0.8% soluble concentrate/liquid
copper (in the form of an ammonia complex) (022702)
000358-00121

&208.0015 8% (0.8 lb/gal) soluble concentrate/liquid
copper (in the form of an ammonia complex) (022702)
008901-00014

&204.3016 4.3% liquid-ready to use
copper (in the form of an ammonia complex) (022702) plus ammonium arsenate (013601)
003098-00003 011351-00001

COPPER (IN THE FORM OF AN AMMONIA COMPLEX)

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number

TERRESTRIAL FOOD CROP

(Agricultural Crops)

/28001AA	**Beans**
FBZFXAV	Bacterial blight (common) (Xanthomonas)
FBZRPGG	Halo blight (Pseudomonas)
	(0.8 lb/gal or 8% SC/L)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/10002AA	**Cantaloupe**
FBAAAAX	Alternaria blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFABPEA	Downy mildew (Pseudoperonospora)
FFACSCO	Powdery mildew (Sphaerotheca)
FEAJCCV	Scab (Cladosporium)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/28003AA	**Celery**
FBZAPDZ	Bacterial blight (Pseudomonas)
FBAMCBM	Early blight (Cercospora)
FBASSBL	Late blight (Septoria)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/10010AA	**Cucumber**
FBAAAAX	Alternaria blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFACSCO	Powdery mildew (Sphaerotheca)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/10005AA	**Honeydew Melons**
FBAAAAX	Alternaria blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFABPEA	Downy mildew (Pseudoperonospora)
FFACSCO	Powdery mildew (Sphaerotheca)
FEAJCCV	Scab (Cladosporium)
	(0.8 lb/gal or 8% SC/L)
	008901-00014

/10006AA	Muskmelons
FBAAAAX	Alternaria blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFABPEA	Downy mildew (Pseudoperonospora)
FFACSCO	Powdery mildew (Sphaerotheca)
FEAJCCV	Scab (Cladosporium)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/28015AA	Peanuts
FMBCCBM	Cercospora leaf spot
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/28017AA	Peppers
FMZAXAA	Bacterial spot (Xanthomonas)
FMBCCBM	Cercospora leaf spot
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/14013AA	Potato
FBAMAAX	Early blight (Alternaria)
FBASPCN	Late blight (Phytophthora)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/28023AA	Soybeans
FBZAPDZ	Bacterial blight (Pseudomonas)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/10013AA	Squash (Summer)
FBAAAAX	Alternaria blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFACSCO	Powdery mildew (Sphaerotheca)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/10014AA	Squash (Winter)
FBAAAAX	Alternaria blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFACSCO	Powdery mildew (Sphaerotheca)
	(0.8 lb/gal or 8% SC/L)
	008901-00014

/28020AA	Sugar Beets
FMBCCBM	Cercospora leaf spot
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/11005AA	Tomato
FMZAXBA	Bacterial spot (Xanthomonas)
FBAMAEP	Early blight (Alternaria)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/03009AA	Walnut
FBZAXAA	Walnut blight (Xanthomonas)
	(0.8 lb/gal or 8% SC/L)
	008901-00014
/10008AA	Watermelons
FBAAAAX	Alternaria blight
FMABPDZ	Angular leaf spot (Pseudomonas)
FFABPEA	Downy mildew (Pseudoperonospora)
FFACSCO	Powdery mildew (Sphaerotheca)
FEAJCCV	Scab (Cladosporium)
	(0.8 lb/gal or 8% SC/L)
	008901-00014

TERRESTRIAL NON-FOOD CROP

(Ornamental Plants and Forest Trees)

/31065AA	Chrysanthemum
FFACQBB	Powdery mildew
	(0.8% SC/L)
	000358-00121
/31129AA	Delphinium
FFACQBB	Powdery mildew
	(0.8% SC/L)
	000358-00121
/31121AA	Hollyhock
FFACQBB	Powdery mildew
	(0.8% SC/L)
	000358-00121
/31156AA	Phlox
FFACQBB	Powdery mildew
	(0.8% SC/L)
	000358-00121

COPPER (IN THE FORM OF AN AMMONIA COMPLEX)

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/34120AA FFACQBB	Rose Powdery mildew (0.8% SC/L) 000358-00121
/31197AA FFACQBB	Sweet Pea Powdery mildew (0.8% SC/L) 000358-00121

INDOOR

(Wood or Wood Structure Protection Treatments)

/64002NA FYAEQBB	Wood Protection Treatment (Seasoned Forest Products) Wood rot/decay (4.3% RTU) 003098-00003 011351-00001

FINAL
SAI/MAI
c022901

COPPER CARBONATE*

TYPE PESTICIDE: Fungicide

FORMULATIONS:
D (20%, 55%)
WP (51%)
Impr (1.3%)

GENERAL WARNINGS AND LIMITATIONS: Copper carbonate is compatible with most organophosphate and carbamate pesticides. Do not use with 6-methyl-2,3-quinoxalinedithiol cyclic S,S-dithiocarbamate, lime sulfur, or strongly acidly spray materials.
Dosage rates and formualtions are given in metallic copper equivalent.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL FOOD CROP		
	(Agricultural Crops)		

General Warnings and Limitations: The use of a spreader-sticker is recommended for sprays.

/04001AA	Apple		Exempt Full bloom application through 2.04 pounds per acre.
FBANEBI	Fire blight (Erwinia)	0.255 lb/100 gal [250-800 gal/A] (51% WP)	Foliar application. Apply at full bloom, or at petal fall, calyx or late bloom stage.
/05001AA	Apricot		Exempt Full bloom application through 12.75 pounds per acre.
FDZAPDZ	Bacterial canker (gummosis) (Pseudomonas)	2.04-2.55 lb/ 100 gal (51% WP)	Dormant, delayed dormant, and foliar application. For bacterial canker, apply in October and November. For shothole in the Sacramento Valley, apply between November 15 and December 15. For brown rot, apply at red bud, early and late bloom stages.
FBADMCB	Brown rot blossom and twig blight (Monilinia)		
FBAZCEL	Shothole (Coryneum)		
FBADMCB	Brown rot twig blight (Monilinia)	1.275 lb/100 gal (51% WP)	Dormant application. Apply with a dormant oil spray.

*basic copper carbonate

FINAL
SAI/MAI
c022901

COPPER CARBONATE*

TYPE PESTICIDE: Fungicide

FORMULATIONS:
D (20%, 55%)
WP (51%)
Impr (1.3%)

GENERAL WARNINGS AND LIMITATIONS: Copper carbonate is compatible with most organophosphate and carbamate pesticides. Do not use with 6-methyl-2,3-quinoxalinedithiol cyclic S,S-dithiocarbamate, lime sulfur, or strongly acidly spray materials.
Dosage rates and formualtions are given in metallic copper equivalent.

TERRESTRIAL FOOD CROP

(Agricultural Crops)

General Warnings and Limitations: The use of a spreader-sticker is recommended for sprays.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/04001AA	Apple		Exempt Full bloom application through 2.04 pounds per acre.
FBANEBI	Fire blight (Erwinia)	0.255 lb/100 gal [250-800 gal/A] (51% WP)	Foliar application. Apply at full bloom, or at petal fall, calyx or late bloom stage.
/05001AA	Apricot		Exempt Full bloom application through 12.75 pounds per acre.
FDZAPDZ	Bacterial canker (gummosis) (Pseudomonas)	2.04-2.55 lb/100 gal (51% WP)	Dormant, delayed dormant, and foliar application. For bacterial canker, apply in October and November. For shothole in the Sacramento Valley, apply between November 15 and December 15. For brown rot, apply at red bud, early and late bloom stages.
FBADMCB	Brown rot blossom and twig blight (Monilinia)		
FBAZCEL	Shothole (Coryneum)		
FBADMCB	Brown rot twig blight (Monilinia)	1.275 lb/100 gal (51% WP)	Dormant application. Apply with a dormant oil spray.

*basic copper carbonate

COPPER CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
05002AA	Cherry		Exempt Petal fall application through 20.4 pounds per acre.
BADMCB MBCCDJ	Brown rot blossom and twig blight (Monilinia) Cherry leaf spot (Coccomyces)	2.04-2.55 lb/ 100 gal [250-800 gal/A] (51% WP)	Delayed dormant and foliar application. For brown rot, apply at popcorn or full bloom, and at petal fall. For leaf spot, apply at petal fall.
02000AA	Citrus Fruits		Exempt Apply through 12.75 pounds per acre.
GAJPCN	Brown rot gummosis (Phytophthora)	0.255-0.64 lb/100 gal or 1.53-7.65 lb/A (51% WP)	Soil, basal bark, and foliar application. Apply in late fall at time of first rains. Spray skirts of trees from the ground up to 3 to 4 feet high with up to 6 gallons of spray per tree. Also apply 2 to 4 gallons of spray on the trunk and ground under the tree. Repeat in extremely wet years.
MBCSBL	Leaf spot (Septoria)	0.38-0.765 lb/100 gal (51% WP)	Foliar application. Apply to entire tree in late fall. In copper sensitive or smog areas add 1 pound of lime as a protective agent.
GAJPCN MBCSBL RAFAAA	Brown rot gummosis (Phytophthora) Leaf spot (Septoria) Leafhopper (repellancy)	0.51-0.765 lb/100 gal or 1.53-12.75 lb/A (51% WP)	Use limited to the San Joaquin Valley. Foliar application. Add 15 to 30 pounds of lime per 100 gallons. Apply October through November.
		0.255-0.51 lb/100 gal (51% WP)	Foliar application. Add to gibberelic acid sprays as an aid in the control of brown rot and leaf spot.
05003AA 05004AA	Nectarine Peach		Exempt Pink bud application through 12.75 pounds per acre.
FBADMCB FEAGTAB FBAAQAB	Brown rot blossom and twig blight (Monilinia) Leaf curl (Taphrina) Peach blight	1.53-2.55 lb/ 100 gal (51% WP)	Dormant and delayed dormant application. For leaf curl and peach blight, apply 2.04 to 2.55 pounds per 100 gallons between November 15 and December 15. For leaf curl, apply 1.53 pounds per 100 gallons in a dormant spray, if the late fall

COPPER CARBONATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Nectarine cluster (continued)		
			spray has been omitted. For brown rot and peach blight, apply 2.04 to 2.55 pounds per 100 gallons at pink bud.
PPMAAAC	Copper deficiency	0.51-0.765 lb/100 gal (51% WP)	Copper deficiency spray. Apply alone or with an oil emulsion.
/28014AA	Olive		Exempt Preharvest (late fall) application through 16.32 pounds per acre. Wash olives after picking.
FMBHCFK	Peacock spot (Cycloclonium)	1.53-2.55 lb/100 gal (51% WP)	Foliar application. Apply to whole tree in late fall.
	Peach		See Nectarine cluster.
/04003EA	Pear		3 ppm of combined copper Impregnated fruit wrap with 1.3 percent metallic copper equivalent.
FIBFBAW	Nest rot (Botrytis)	[MAI] — (1.3% Impr)	Fruit wrap. Apply 1 wrap per fruit within 1 week after harvesting and before storage. Formulated with ethoxyquin.
/28019AA /28065AA	Sorghum Wheat		Exempt Seed treatment (dry) through 0.825 ounce per bushel of seed. Do not use treated seed for food, feed, or oil. Avoid inhaling dust by wearing a respirator.
FLATTAQ	Common bunt/stinking smut (Tilletia) (on wheat)	0.4-0.6 oz/bu (20% D) or	Seed treatment. Seeds may be treated in a small tightly closed container or in a rotating drum treater. Treated seed should be poured out on a screen to remove excess formulation. The excess dust can be used again.
FLAMSCC	Kernel smut (Sphacelotheca) (on sorghum)	0.825 oz/bu (55% D)	

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/03009AA	**Walnut**		Exempt
FBAAXAA	Bacterial blight (Xanthomonas)	1.02-1.53 lb/ 100 gal (51% WP)	Delayed dormant and foliar application. Two sprays are recommended. Apply first in early prebloom with 1 percent of flowers showing and again when 10 percent of flowers are showing. In severe disease areas, make a third application in the post bloom period.
	Wheat		See Sorghum cluster.

COPPER CARBONATE

Listing of Registered Pesticide Products by Formulation

&020.0003 20% dust
copper carbonate (022901)
001990-00027 001990-00403 002124-00530

&050.0003 55% dust
copper carbonate (022901)
001109-00024

&051.0006 51% wettable powder
copper carbonate (022901)
000400-00382

&001.3010 1.3% impregnated materials
copper carbonate (022901) plus 6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline (055501)
003222-00006

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number

TERRESTRIAL FOOD CROP

(Agricultural Crops)

/04001AA	Apple
FBANEBI	Fire blight (Erwinia)
	(51% WP)
	000400-00382
/05001AA	Apricot
FDZAPDZ	Bacterial canker (gummosis) (Pseudomonas)
FBADMCB	Brown rot blossom and twig blight (Monilinia)
FBADMCB	Brown rot twig blight (Monilinia)
FBAZCEL	Shothole (Coryneum)
	(51% WP)
	000400-00382
/05002AA	Cherry
FBADMCB	Brown rot blossom and twig blight (Monilinia)
FMBCCDJ	Cherry leaf spot (Coccomyces)
	(51% WP)
	000400-00382
/02000AA	Citrus Fruits
FGAJPCN	Brown rot gummosis (Phytophthora)
FMBCSBL	Leaf spot (Septoria)
IRAFAAA	Leafhopper (repellancy)
	(51% WP)
	000400-00382
/05003AA	Nectarine
FBADMCB	Brown rot blossom and twig blight (Monilinia)
PPMAAAC	Copper deficiency
FEAGTAB	Leaf curl (Taphrina)
FBAAQAB	Peach blight
	(51% WP)
	000400-00382
/28014AA	Olive
FMBHCFK	Peacock spot (Cycloclonium)
	(51% WP)
	000400-00382

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/05004AA	**Peach**
FBADMCB	Brown rot blossom and twig blight (Monilinia)
PPMAAAC	Copper deficiency
FEAGTAB	Leaf curl (Taphrina)
FBAAQAB	Peach blight
	(51% WP)
	000400-00382
/04003EA	**Pear**
FIBFBAW	Nest rot (Botrytis)
	(1.3% Impr)
	003222-00006
/28019AA	**Sorghum**
FLAMSCC	Kernel smut (Sphacelotheca)
	(20% D)
	001990-00027 001990-00403 002124-00530
	(55% D)
	001109-00024
/03009AA	**Walnut**
FBAAXAA	Bacterial blight (Xanthomonas)
	(51% WP)
	000400-00382
/28065AA	**Wheat**
FLATTAQ	Common bunt/stinking smut (Tilletia)
	(20% D)
	001990-00027 001990-00403 002124-00530
	(55% D)
	001109-00024

FINAL
SAI/SAI
c008001

BASIC COPPER CHLORIDE

TYPE PESTICIDE: Fungicide

FORMULATIONS: Tech (57%)

GENERAL WARNINGS AND LIMITATIONS: For use in formulations to be applied to potatoes and tomatoes. The formulation is given in percent metallic copper equivalent.

BASIC COPPER CHLORIDE

Listing of Registered Pesticide Products by Formulation

&057.0001 57% (metallic copper equivalent) technical chemical
basic copper chloride (008001)
008732-00002

&000.0090 Formulation not identified
basic copper chloride (008001)
000495-00005*
*jacket currently unavailable for review

BASIC COPPER CHLORIDE

Auxiliary Documentation

1. For Reg. No. 8732-2, the percent of basic copper chloride is 99.7687%. The product name is the ultimate formulation: copper oxychloride.

2. Reg. No. 495-5 was not available for review. A formulation could not be determined from other data sources.

FINAL
MAI/MAI
c023701

EPA Index to Pesticide Chemicals

COPPER CHLORIDE (DIHYDRATE)

TYPE PESTICIDE: Fungicide

FORMULATIONS: EC (1%)

GENERAL WARNINGS AND LIMITATIONS: The dosage and formulation are given in metallic copper equivalent.
Observe warnings and limitations for the other active ingredient.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL NON-FOOD CROP		
	(Ornamental Plants and Forest Trees)		
/31081AA /31005AA	Cymbidium Orchids		
FIAAGAN	Gloeosporium rot	[MAI] 1 tbls 1% EC/ gal water/12 sq.ft of soil (1% EC)	Soil application. Water soil 12 hours prior to application. Do not water for 24 hours following application. Formulated with dichloroethyl ether.
/31005AA	Ornamental Bulb Plants		
FIAAFAK	Fusarium rot		
		Refer to Cymbidium Orchids for use and limitation information.	

Listing of Registered Pesticide Products by Formulation

6201.0012 2.68% (1% metallic copper equivalent) emulsifiable concentrate
copper chloride (dihydrate) (023701) plus dichloroethyl ether (029502)
000190-00020

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number

TERRESTRIAL NON-FOOD CROP

(Ornamental Plants and Forest Trees)

/31081AA /31005AA FIAAGAN	**Cymbidium Orchids** Gloeosporium rot (1% EC) 000190-00020
/31005AA FIAAFAK	**Ornamental Bulb Plants** Fusarium rot (1% EC) 000190-00020

FINAL
SAI/SRI
c044005

COPPER CITRATE

TYPE PESTICIDE: Antimicrobial, Algaecide

FORMULATIONS: RTU (11.24%)

GENERAL WARNINGS AND LIMITATIONS: None.

Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations

Currently there are no federally registered products containing this chemical.

COPPER CITRATE

Listing of Registered Pesticide Products by Formulation

9999999 State Label Registration

CA Reg. No.
009743-05241

FINAL
SAI/MAI
c023401

COPPER HYDROXIDE

TYPE PESTICIDE: Fungicide, Antifoulant, Herbicide

FORMULATIONS:

Tech (57.3%, 59%)
FI (57.3%)
D (1.6%, 2.6%, 2.7%, 4.39%)
WP (4.4%, 4.5%, 4.6%, 9.5%, 9.9%, 10.4%, 20%, 32%, 50%)
F1C (0.53 lb/gal, 1 lb/gal, 13.4%, 2 lb/gal, 2.12 lb/gal, 17.5%, 3.04 lb/gal)
RTU (1.95%, 3.91%, 4.56%, 5.21%, 5.73%, 5.86%, 13.7%, 14.26%, 15.3%)

GENERAL WARNINGS AND LIMITATIONS: Compatible with most commonly used insecticides and adjuvants.

Dosages and formulations are given in metallic copper equivalents. The percent of copper hydroxide for each label is given in the Listing of Registered Pesticide Products by Formulation (page 29).

Observe all warnings and limitations for other active ingredients in multiple active ingredient labels or in tank mixes.

Do not enter treated area without protective clothing until spray has dried.

Registration Number 008901-00001 (50 percent wettable powder) contains the following information: Application of the product to crops listed on the label at the rates indicated, just prior to anticipated frost conditions, will afford control of ice nucleating bacteria (*Pseudomonas syringae*, *Pseudomonas fluorescens*, and *Erwinia herbicola*) and may therefore provide protection against light frost. These applications are not recommended for those geographical areas where weather conditions favor severe frost.

NOTE: Seed treatment uses are placed as a group after the agricultural crop uses.

Definition of Terms:

MAI - multiple active ingredient(s)

COPPER HYDROXIDE

TERRESTRIAL FOOD CROP

(Agricultural Crops)

General Warnings and Limitations: For homeowner uses, 1 level tablespoon of the 50 percent wettable powder per gallon of water is equivalent to 1 pound of the product per 100 gallons. Similarly, 1 teaspoon of the 3.04 pounds per gallon flowable concentrate per gallon of water is equivalent to 1 pint of the product per 100 gallons.
Unless noted otherwise, application can be made from most types of spray equipmment at the following gallonages. For dilute, high volume sprays apply from 25 to 100 gallons of water per acre for most vegetable crops, 400 to 800 gallons per acre for fruit orchards and up to 1,500 gallons per acre as may be required for large citrus groves. For concentrate ground sprays, apply from 5 to 20 gallons per acre for most vegetable crops and 25 to 100 gallons per acre for fruit and nut crops. For aircraft application, use 3 to 15 gallons per acre. No additional surfactants are required.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/23001AA	Alfalfa		Exempt No preharvest interval through 1.01 pounds per acre. Spray injury may occur with sensitive varieties such as Lahontan.
FMBCCBM	Cercospora leaf spot	1.0-1.01 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal F1C)	Foliar application. Apply 10 to 14 days before each harvest or earlier if disease threatens. Apply with ground equipment or by aircraft.
FMBCLAT	Leptosphaerulina leaf spot		
/03001AA	Almond		Exempt Apply to full bloom stage through 6.0 pounds per acre; or, apply up to 8 weeks postbloom through 0.13 pound per 100 gallons. Slight leaf injury may occur from postbloom spray.
FBAZPDZ	Bacterial shoot blight (Pseudomonas)	1.0-2.03 lb/100 gal or concentrate or aircraft: 3.0-6.0 lb/A (20%, 50% WP) (3.04 lb/gal F1C) or	Dormant or delayed dormant application. Apply at dormant to early pink bud. Apply concentrate sprays in 25 to 100 gallons per acre and in 15 to 25 gallons per acre by aircraft.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Almond (continued)		
		0.25-0.34 oz/gal (1 lb/gal FlC)	
		0.125-0.13 lb/100 gal (50% WP) (3.04 lb/gal FlC)	Foliar application. In sprinkler irrigated orchards or where disease is severe, apply 2 to 4 sprays at 2 week postbloom intervals or just before sprinkling.
FBADMCB FBAZCEL	Brown rot blossom blight (Monilinia) Shothole (Coryneum blight)	1.0-1.52 lb/100 gal [300-400 gal/A] (20%, 50% WP) (2 lb/gal, 3.04 lb/gal FlC) or concentrate or aircraft: 3.0-4.0 lb/A (50% WP) or 0.16-0.25 oz/gal (1 lb/gal FlC)	Dormant, delayed dormant, and foliar applications. Apply in late dormant before foliage buds swell if frequent rainfall occurs. Apply again in popcorn. To avoid plant injury, do not apply after full bloom. Apply in 7.5 to 25 gallons per acre by aircraft.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/04001AA	Apple		Exempt No preharvest interval through 8.0 pounds per acre. Use on yellow varieties may cause discoloration. To avoid, pick before spraying. Discontinue full coverage spray when green-tip reaches 0.5 inch as phytotoxity may occur from later applications. Do not use drench treatment if soil pH is below 5.5 or copper toxicity may result.
FMAGPDZ	Blister spot (Pseudomonas)	1.5-2.03 lb/ 100 gal [300-400 gal/A] (50% WP) (3.04 lb/gal FlC) or 0.25-0.34 oz/ gal (1 lb/gal FlC)	Foliar or postharvest application. Apply before fall rains.
FDAANAF	European canker (Nectria)		
FAAANAK	Northwestern anthracnose (Neofabraea)		
FBANEBI	Fire blight (Erwinia)	1.0-2.03 lb/ 100 gal (50% WP) (3.04 lb/gal FlC) or 0.16-0.31 oz/ gal (1 lb/gal FlC)	Delayed dormant application. Apply as a full cover spray between silver-tip and green-tip.
FDAGPCN	Phytophthora collar rot	2.0-2.03 lb/ 100 gal (50% WP) (3.04 lb/gal FlC) or 0.31 oz/gal (1 lb/gal FlC)	Use limited to areas other than CA. Trunk drench. Apply 4 gallons of suspension as a drench on the lower trunk area of each tree. Apply either in early spring or in fall after harvest each year.

COPPER HYDROXIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/05001AA	Apricot		Exempt Apply up to full bloom through 6.08 pounds per acre. Do not apply after bloom to avoid spray injury.
FBADMCB	Brown rot blossom blight (Monilinia)	1.0-1.52 lb/100 gal [300-400 gal/A] (20%, 50% WP) (2 lb/gal, 3.04 lb/gal FlC) or concentrate or aircraft: 4.0 lb/A (50% WP) or 0.16-0.25 oz/gal (1 lb/gal FlC)	Delayed dormant and foliar application. Apply at popcorn to full bloom.
FBAZCEL	Shothole (Coryneum blight)		
/28000AA	Avocado		Exempt Apply up to 6 months after bloom buds swell through 5.07 pounds per acre.
FEAJSCB	Scab (spot anthracnose) (Sphaceloma)	1.0-1.01 lb/100 gal or 4.0-5.07 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply when bloom buds begin to swell. Repeat at monthly intervals for 5 to 6 applications. Consult a State Agricultural Extension Service for recommendations.

COPPER HYDROXIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/06002AA	**Banana**		Exempt No preharvest interval through 1.01 pounds per acre by aircraft; or, apply up to 2 weeks after fruit emergence through 2.03 pounds per 100 gallons.
FIEQPOZ	Black pitting (Piricularia grisea)	2.0-2.03 lb/ 100 gal (50% WP) (2 lb/gal, 3.04 lb/gal FlC)	Fruit and leaf crown application. Apply directly to the fruit stem and include the basal portion of the leaf crown. Apply during the first and second week after emergence.
FMBOCBM	Sigatoka disease (Cercospora leaf spot)	aircraft: 1.0-1.01 lb/A [3 gal/A including 0.5 gal agricultural oil] (50% WP) (2 lb/gal, 3.04 lb/gal FlC)	Foliar application. Apply at 14 day intervals throughout the wet season or at 21 day intervals during dry periods.
/28063AA /28065AA	**Barley** **Wheat**		Exempt Apply 10 days after early heading through 1.01 pounds per acre.
FCADHAM FMBCSBL	Helminthosporium leaf blotch Septoria leaf blotch	0.75-1.01 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply at early heading and repeat 10 days later.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28001AA	**Beans**		Exempt No preharvest interval through 1.52 pounds per acre.
FBZFXAV FBZRPGG	Bacterial blight (common) (Xanthomonas) Halo blight (Pseudomonas)	0.5-1.52 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.094-0.25 oz/gal (1 lb/gal FlC)	Foliar application. As a protective spray, apply when plants are 6 inches high. Repeat at 7 to 14 day intervals depending on local conditions. --OR MAI--
		[MAI] 1-3 qt 17.5% FlC/A (17.5% FlC)	Formulated with sulfur.
/01002AA	**Blackberry**		Exempt Delayed dormant and postharvest applications through 2.03 pounds per 100 gallons. Apply in late spring through 1.01 pounds per 100 gallons.
FMAMMCO FMAMSBL	Leaf and cane spot (Mycosphaerella) (Septoria)	1.0-2.03 lb/100 gal (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.15-0.31 oz/gal (1 lb/gal FlC)	Delayed dormant, foliar, and postharvest applications. Add 1 quart superior-type oil per 100 gallons for all sprays. Apply delayed dormant spray after training in spring at high rate. Apply in late spring at low rate. Apply in fall after harvest at high rate.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/13005AA /13006AA /13007AA /13008AA	Broccoli Brussels Sprouts Cabbage Cauliflower		Exempt No preharvest interval through 0.51 pound per acre for broccoli, brussels sprouts, and cauliflower or 1.01 pounds per acre for cabbage. A slight reddening of older leaves may occur on broccoli and a slight flecking of wrapper leaves may occur on cabbage at the high rate.
FFABPAU	Downy mildew (Peronospora)	0.25-0.51 lb/A [min. 25 gal/A] (50% WP) (3.04 lb/gal FlC) or 0.062-0.094 oz/gal (1 lb/gal FlC)	Foliar application. Apply after transplants are set in the field, or shortly after emergence of field-seeded crops or when conditions favor disease development. Repeat at 7 day intervals.
/13007AA FIAFXAA FMBCAAX	(cabbage) Black rot (Xanthomonas) Leaf spot (Alternaria)	1.0-1.01 lb/A [min. 25 gal/A] (50% WP) (3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply after transplants are set in the field, or shortly after emergence of field-seeded crops or when conditions favor disease development. Repeat at 7 to 10 day intervals.
	Brussels Sprouts		See Broccoli cluster.
	Cabbage		See Broccoli cluster.
/10002AA /10005AA /10006AA	Cantaloupe Honeydew Melons Muskmelons		Exempt No preharvest interval through 1.01 pounds per acre.
FFABPEA	Downy mildew (Pseudoperonospora)	1.0-1.01 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or	Foliar application. Apply before disease appears at weekly intervals.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Cantaloupe cluster (continued)		
		0.16 oz/gal (1 lb/gal FlC)	
/28073AA	Carrots		Exempt No preharvest interval through 1.01 pounds per acre.
FBAMCBM	Early blight (Cercospora)	1.0-1.01 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply when disease threatens. Repeat at 7 to 14 day intervals depending upon disease severity.
	Cauliflower		See Broccoli cluster.
/28003AA	Celery		Exempt No preharvest interval through 1.01 pounds per acre.
FBAAPDZ FBAMCBM FBASSBL	Bacterial blight (Pseudomonas) Early blight (Cercospora) Late blight (Septoria)	1.0-1.01 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply as soon as plants are first established in the field. Repeat at 5 to 7 day intervals depending upon disease severity and weather. One or 2 quarts of a suitable agricultural spray oil per acre may be used as a spreader-sticker.
/05002AA	Cherry		Exempt Apply in October, January, or August through 3.04 pounds per 100 gallons, or 1.52 pounds per 100 gallons up to full bloom.
FBADMCB	Brown rot blossom rot (Monilinia)	1.0-1.52 lb/ 100 gal (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or	Delayed dormant and foliar application. Apply as a full cover spray at popcorn and full bloom.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Cherry (continued)		
		0.16-0.25 oz/ gal (1 lb/gal F1C)	
FBAAPDZ	Dead bud (Pseudomonas)	3.0-3.04 lb/ 100 gal (50% WP) (2 lb/gal, 3.04 lb/gal F1C) or 0.5 oz/gal (1 lb/gal F1C)	Apply in October (before heavy rain falls) and again in January adding 1 pint of superior-type oil per 100 gallons. In orchards where disease is severe, a spray should also be applied in August.
FBAZCEL	Shothole (Coryneum blight)		
/02000AA	Citrus Fruits		Exempt No preharvest interval through 3.04 pounds per acre. Concentrate sprays may be applied at equivalent rates.
FGAJPCN	Brown rot gummosis (Phytophthora)	0.25-0.51 lb/ 100 gal (20%, 50% WP) (3.04 lb/gal F1C) or 0.062-0.094 oz/gal (1 lb/gal F1C)	Foliar and soil applications. Apply in fall just before or after first heavy rains. Apply to skirts of trees to height of at least 4 feet. Apply also to bare ground 1 foot beyond skirt. For CA, in areas subject to copper injury, add 0.333 to 1 pound of high quality lime per 0.5 pound metallic copper.
FMAYMCO	Greasy spot (Mycosphaerella)	0.375-0.76 lb/100 gal or aircraft: 3.0-3.04 lb/ 10 gal/A (50% WP) (2 lb/gal, 3.04 lb/gal F1C) or 0.062-0.125 oz/gal (1 lb/gal F1C)	Foliar application. Apply as prebloom and postbloom sprays.
FIBLDAP	Melanose (Diaporthe)		
FMBIMCO	Pink pitting (Mycosphaerella)		
FAABEAH	Scab (spot anthracnose) (Elsinoe)		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Citrus Fruits (continued)		
FIBLDAP FAAAEAH	Melanose (Diaporthe) Scab (spot anthracnose) (Elsinoe)	2.08-2.09 lb/ 500 gal (9.5%, 9.9%, 10.4% WP)	Use limited to FL. (All formulations include nutritional materials.) Dormant and foliar application. For scab, apply just before flush appears, usually late January or early February. For melanose and scab, apply 1 to 2 weeks after petal fall. --OR MAI--
		[MAI] 2.07 lb/500 gal (4.4%, 4.5%, 4.6% WP)	Formulated with sulfur.
/07001AA	Cocoa		Exempt No preharvest interval through 4.31 pounds per acre.
FIFAPLG	Black pod (Phytophthora palmivora)	wet areas: 1.0-2.28 lb/A or drier areas: 3.25-4.31 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC)	Foliar application. Apply at the start of the rainy season and repeat while infection conditions persist. In high rainfall areas, apply at 14 to 21 day intervals at a rate depending upon disease severity. For drier areas, where 2 to 4 applications are recommended during critical infection periods and at long application intervals, apply at a rate according to disease incidence and planting density.
/07002AA	Coffee		Exempt No preharvest interval through 4.05 pounds per acre as a spray or 4.29 pounds per acre as a dust.
FJAGHAO	Coffee leaf rust (Hemileia) (in Brazil)	average density plantings: 1.75-2.79 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or	Foliar application. Apply from September to March depending upon altitude and local recommendations. Apply at 3 to 4 week intervals depending upon disease severity and rainfall conditions. Apply dust using ground equipment.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Coffee (continued)		
		high density plantings: 3.5-4.05 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 1.24-4.29 lb/A (2.7% D)	
FMBACBM **FGAOCEF**	Iron spot (Cercospora) Pink disease (Corticium)	1.0-1.01 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC)	Foliar application. Apply as a dilute or concentrate spray. Apply at the start of the wet season and continue at monthly intervals for 3 applications.
/01010AA	**Cranberry**		Exempt No preharvest interval through 4.05 pounds per acre.
FIBFQBB	Fruit rot	4.0-4.05 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC)	Foliar application. Apply beginning in late bloom. One or 2 additional applications made at 10 to 14 day intervals may be needed, depending upon disease pressure. Consult a State Agricultural Extension Service for recommendations.
/10010AA	**Cucumber**		Exempt No preharvest interval through 1.01 pounds per acre.
FMABPDZ **FFABPEA**	Angular leaf spot (Pseudomonas) Downy mildew (Pseudoperonospora)	0.75-1.01 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.125-0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply weekly once the plants begin to vine.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/01011AA /01013AA	Currant Gooseberry		Exempt Apply after petal fall through 5.07 pounds per acre.
FMBCQBB	Leaf spot	5.0-5.07 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.81 oz/gal (1 lb/gal FlC)	Postharvest, delayed dormant, and foliar application. Apply 3 times, first after harvest, then before bloom, and after petal fall.
/11001AA	Eggplant		Exempt No preharvest interval through 1.01 pounds per acre. Use limited to areas other than CA.
FAAACDP	Anthracnose (Colletotrichum)	1.0-1.01 lb/A (50% WP) (3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply before disease appears. Repeat at 7 to 10 day intervals.
FBAMAAX	Early blight (Alternaria)		
FBAAPBU	Phomopsis blight		
/03005AA	Filbert		Exempt No preharvest interval through 3.04 pounds per 100 gallons.
FBAAXAA	Bacterial blight (Xanthomonas)	2.0-3.04 lb/100 gal (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.31-0.5 oz/gal (1 lb/gal FlC)	Foliar and postharvest application. Add 1 pint superior-type oil per 100 gallons. Apply in late August or early September. In seasons of heavy rainfall, apply another spray when three-fourths of the leaves have dropped.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/01014AA	Grapes		Exempt No preharvest interval through 1.01 pounds per acre. Slight to severe foliage injury may occur on copper-sensitive varieties such as Concord, Delaware, Niagara, and Rosette.
FIBFGBG	Black rot (Guignardia)	1.0-1.01 lb/A (50% WP) (3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Add 2 to 6 pounds of hydrated lime per acre and apply as a dilute or concentrate spray. Apply as the last 1 or 2 late summer sprays following an early season application of another fungicide. Consult a State Agricultural Extension Service for timing recommendations.
FFABPCV	Downy mildew (Plasmopara)		
FFACUAB	Powdery mildew (Uncinula)		
	Gooseberry		See Currant cluster.
	Honeydew Melons		See Cantaloupe cluster.
/08020AA	Hops		Exempt Apply through 1.01 pounds per 100 gallons. Do not apply within 2 weeks of harvest.
FFABPEA	Downy mildew (Pseudoperonospora)	1.01 lb/100 gal (50% WP) (3.04 lb/gal FlC)	Crown treatment and foliar application. Apply to crown (after pruning, but before training) as needed. After training, apply at approximately 10 day intervals.
/13020AA	Lettuce		Exempt No preharvest interval through 1.01 pounds per acre.
FFABBBA	Downy mildew (Bremia)	0.5-1.01 lb/A (50% WP) (3.04 lb/gal FlC) or 0.094-0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply when disease first appears and repeat at 7 to 10 day intervals as needed to suppress disease.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/06007AA	Mango		Exempt No preharvest interval through 5.07 pounds per acre. Use limited to FL.
FAAAGAP	Anthracnose (Glomerella)	1.0-1.01 lb/ 100 gal or 4.0-5.07 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply monthly after fruit set until harvest.
	Muskmelons		See Cantaloupe cluster.
/05003AA /05004AA	Nectarines Peaches		Exempt Apply through 0.17 pound per 100 gallons. Do not apply within 3 weeks of harvest. Dormant application through 8.11 pounds per acre. Slight defoliation and spotting of leaves may occur from use in cover sprays.
FMCBXAA	Bacterial fruit and leaf spot (Xanthomonas)	0.125-1.01 lb/100 gal (20%, 50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.016-0.16 oz/gal (1 lb/gal FlC)	Dormant and foliar applications. Apply in dormant stage at high rate. Apply at first and second cover sprays at low rate.
FBADMCB	Brown rot blossom blight (Monilinia)	1.0-1.5 lb/ 100 gal (20%, 50% WP) (3.04 lb/gal FlC) or	Delayed dormant application. Apply at pink bud as a full cover spray. (This application also aids in the control of leaf curl and shothole.)

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Nectarines (continued)		
		0.16-0.25 oz/ gal (1 lb/gal FlC)	
FEAGTAB FBAZCEL	Leaf curl (Taphrina) Shothole (Coryneum blight)	1.0-2.03 lb/ 100 gal or 4.0-8.11 lb/A (20%, 50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16-0.34 oz/ gal (1 lb/gal FlC)	Dormant application. Apply at leaf fall. Apply at high per acre rate when rainfall is very heavy and disease pressure is high. Apply again in late dormant if rain is frequent. May be applied with agricultural spray oil. For concentrate sprays, apply at equivalent rates in 100 gallons water.
/28014AA	**Olive**		Exempt Apply through 6.08 pounds per acre. Use limited to CA.
FMBHCFK	Peacock spot (Cycloconium)	1.0-1.5 lb/ 100 gal or 4.0-6.08 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16-0.25 oz/ gal (1 lb/gal FlC)	Postharvest and foliar applications. Apply before winter rains. Repeat in early spring if disease is severe.
/14011AA	**Onion**		Exempt No preharvest interval through 1.01 pounds per acre.
FFABPAU FCAEAAX	Downy mildew (Peronospora) Purple blotch (Alternaria)	1.0-1.01 lb/A (50% WP) (3.04 lb/gal FlC) or	Foliar application. Apply when plants are 4 to 6 inches high and repeat at 7 to 10 day intervals.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Onion (continued)		
		0.16 oz/gal (1 lb/gal FlC)	
	Peaches		See Nectarines cluster.
/28015AA	**Peanuts**		Exempt No preharvest interval through 1.52 pounds per acre.
FMBCCBM	Cercospora leaf spot	0.75-1.52 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 1 gal 13.7% RTU/A [aircraft] (13.7% RTU) or 0.39-0.65 lb/A (2.6% D)	Foliar application. Apply 40 to 45 days after planting or when disease symptoms appear. Repeat at 10 to 14 day intervals. Apply by ground equipment or aircraft using 3 to 10 gallons per acre by aircraft. May be tank mixed with sulfur (1 to 2 quarts of a 6 pound per gallon flowable concentrate). --OR MAI--
		[MAI] 0.265-0.96 lb/A (32% WP) (0.53 lb/gal FlC) or 3-4 qt 13.4% FlC/A (13.4% FlC) or 1-2 qt 17.5% FlC/A (17.5% FlC) or 0.24-0.4 lb/A (1.6% D)	Formulated with sulfur.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/04003AA	Pear		Exempt Apply throughout bloom period through 0.51 pound per acre. Excessive dosages may cause fruit russet.
FMAHPDZ	Bacterial blast (Pseudomonas)	1.5-2.03 lb/ 100 gal [300-400 gal/A] (20%, 50% WP) (3.04 lb/gal FlC) or 0.25-0.31 oz/ gal (1 lb/gal FlC)	Postharvest and dormant applications. Apply before fall rains and again at dormant before spring growth starts.
FBANEBI	Fire blight (Erwinia)	0.12-0.13 lb/ 100 gal or 0.5-0.51 lb/A (20%, 50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.016 oz/gal (1 lb/gal FlC) or 0.52-0.54 lb/A (2.6%, 2.7% D)	Foliar application. Apply at 5 day intervals throughout the bloom period.
/28016AA	Peas		Exempt No preharvest interval through 1.52 pounds per acre.
FFACEBJ	Powdery mildew (Erysiphe)	0.75-1.52 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or	Foliar application. Apply when disease symptoms first appear. Repeat at weekly intervals. --OR MAI--

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Peas (continued)		
		0.125-0.25 oz/gal (1 lb/gal FlC)	
		[MAI] 1.5-3 qt 17.5% FlC/A (17.5% FlC)	Formulated with sulfur.
/28017AA	Peppers		Exempt No preharvest interval through 1.67 pounds per acre.
FMAAXAA	Bacterial spot (Xanthomonas)	1.0-1.52 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16-0.25 oz/gal (1 lb/gal FlC) or 1.13-1.67 lb/A (2.7% D)	Foliar application. Apply when disease threatens at 7 to 14 day intervals depending upon disease severity. --OR MAI--
		[MAI] 2-3 qt 17.5% FlC/A (17.5% FlC)	Formulated with sulfur.
/14013AA	Potato		Exempt Apply through 2.03 pounds per acre. Do not apply within 2 weeks of harvest.
FBAMAAX FBASPCN	Early blight (Alternaria) Late blight (Phytophthora)	0.5-2.03 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.094-0.125 oz/gal (1 lb/gal FlC)	Foliar application. Apply at 7 to 10 day intervals beginning when plants are 6 inches high. Apply 0.5 to 0.76 pound per acre where disease is light and up to 1.5 to 2.03 pounds per acre where disease is more severe.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/10011AA /10012AA	Pumpkin Squash		Exempt No preharvest interval through 1.52 pounds per acre.
FEAJCCV	Powdery mildew (Erysiphe)	0.75-1.52 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.125-0.25 oz/gal (1 lb/gal FlC)	Foliar application. Apply when plants are 3 weeks old or when disease symptoms first appear. Repeat at weekly intervals.
	Squash		See Pumpkin cluster.
/01016AA	Strawberry		Exempt No preharvest interval through 1.52 pounds per acre. Discontinue applications if signs of phytotoxicity appear.
FBATDAH FMBCMCO	Leaf blight (Dendrophoma) Leaf spot (Mycosphaerella)	1.0-1.5 lb/ 100 gal/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16-0.25 oz/ gal (1 lb/gal FlC)	Delayed dormant and foliar applications. Apply when plants are established and repeat at 7 day intervals throughout the season.
/28020AA	Sugar Beets		Exempt No preharvest interval through 2.53 pounds per acre.
FMBCCBM	Leaf spot (Cercospora)	1.0-2.53 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 1 gal 13.7% RTU/A (13.7% RTU)	Foliar application. Add a suitable agricultural spray oil at 2 quarts per acre. Apply when disease threatens and continue for 4 to 5 applications at 10 to 14 day intervals depending upon weather conditions. Apply the liquid-ready to use formulation using low volume aircraft or mist sprayers. --OR MAI--

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Sugar Beets (continued)		
		[MAI] 2-5 qt 17.5% FlC/A (17.5% FlC)	Formulated with sulfur.
/11005AA	**Tomato**		Exempt No preharvest interval through 2.03 pounds per acre.
FMBPPDZ	Bacterial speck (Pseudomonas)	1.0-1.01 lb/A (50% WP) (3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Foliar application. Apply at 10 to 30 day intervals beginning when disease threatens. Use more frequent applications when disease pressure is high.
FMAAXAA	Bacterial spot (Xanthomonas)	1.0-2.03 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16-0.31 oz/gal (1 lb/gal FlC)	Foliar application. Apply when disease threatens at 7 to 10 day intervals. Apply more frequently when disease is severe. May be tank mixed with 1.2 to 1.6 pounds active ingredient per acre of mancozeb or maneb. --OR MAI--
		[MAI] 2-4 qt 17.5% FlC/A (17.5% FlC)	Formulated with sulfur.
FBAMAAX	Early blight (Alternaria)	1.0-1.52 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16-0.25 oz/gal (1 lb/gal FlC)	Foliar application. Apply when disease threatens at 7 to 10 day intervals. --OR MAI--

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Tomato (continued)		
		[MAI] 2-3 qt 17.5% FlC/A (17.5% FlC)	Formulated with sulfur.
/03009AA	Walnut		Exempt No preharvest interval through 6.3 pounds per acre per application.
FBZAXAA	Walnut blight (Xanthomonas)	1.0-1.01 lb/100 gal [min. 4.0 lb/A] (20%, 50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.16 oz/gal (1 lb/gal FlC)	Delayed dormant and foliar applications. One pint of summer oil emulsion may be added per 100 gallons of spray. Apply at early prebloom when catkins are partially expanded. Repeat 3 times during bloom and early nutlet stage at 7 to 10 day intervals. Additional applications may be required when frequent rainfall occurs. May be applied in concentrate sprays at equivalent rates in 50 to 100 gallons per acre.
/10008AA	Watermelons		Exempt No preharvest interval through 1.52 pounds per acre.
FAAACDP	Anthracnose (Colletotrichum)	0.75-1.52 lb/A (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.125-0.25 oz/gal (1 lb/gal FlC)	Foliar application. Apply as soon as plants become established. Repeat at weekly intervals. For anthracnose, apply 1.0 pound per acre. For downy mildew, apply 0.75 to 1.52 pounds per acre.
FFABPEA	Downy mildew (Pseudoperonospora)		
	Wheat		See Barley cluster.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	(Agricultural Seed Treatment)		
	General Warnings and Limitations: Do not use treated seed for food, feed, or oil purposes. Consult a State Agricultural Experiment Station for specific recommendations.		
/28063AA /28065AA	Barley Wheat		Exempt Seed treatment through 1.06 ounces per 100 pounds of seed.
	Bacterial leaf blight (Pseudomonas syringae) Bacterial leaf streak (Xanthomonas translucens)	1.06 oz/100 lb seed (2.12 lb/gal or 19.5% FlC)	Seed treatment. Dilute product with equal parts of water before applying.
FLATTAQ	Common bunt (Tilletia caries)		
/28072AA	Rice		Exempt Seed treatment through 2.12 ounces per 100 pounds of seed. Phytotoxicity may occur in drill-seeded rice.
FKABADD FKABPES	Seed rot (Achlya) (Pythium)	1.06-2.12 oz/100 lb seed (2.12 lb/gal or 19.5% FlC)	Seed treatment. For ease of handling and when using a seed treating machine, dilute product with an equal volume of water.
	Wheat		See Barley cluster.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL NON-FOOD CROP		
	(Ornamental Plants and Forest Trees)		
/34147AA	Adam's Needle		Discoloration of foliage and/or blooms has been noted on some varieties of azalea, carnation, chrysanthemum, English ivy, and rose. Spray deposits may be removed by washing. Phytotoxicity may depend upon varietal differences of the ornamentals listed. As a test, apply the recommended rate to a few plants and observe after 7 to 10 days for symptoms of phytotoxicity.
FMBCCBM	Leaf spot (Cercospora)	0.094 oz/gal (1 lb/gal FlC)	Foliar application. Apply for thorough coverage beginning at the first sign of disease. Repeat as needed. Apply at shorter intervals during periods of frequent rains or when severe disease conditions persist.
FMBCSBL	Leaf spot (Septoria)		
/34018AA	Aralia		
FMBCAAX	Leaf spot (Alternaria)		
FMBCCBM	Leaf spot (Cercospora)		
FMBCXAA	Leaf spot (Xanthomonas)		
		Refer to Adam's Needle for dose and use information.	
/34022AA	Azalea		
FBADBAW	Botrytis blossom blight		
FBBJBAW	Botrytis leaf and stem blight		
FMBCCBM	Leaf spot (Cercospora)		
FDACPCN	Phytophthora dieback		
FFACQBB	Powdery mildew		

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Azalea (continued)		
		Refer to Adam's Needle for dose and use information.	
/31034AA	**Begonia**		
FAAAGAN	Anthracnose (leaf spot) (Gloeosporium)		
FMZCXAA	Bacterial leaf spot (Xanthomonas)		
		Refer to Adam's Needle for dose and use information.	
/31057AA	**Carnation**		
FBATAAX	Alternaria blight (leaf spot)		
FMZCPDZ	Bacterial leaf spot (Pseudomonas)		
FBAABAW	Botrytis blight		
		Refer to Adam's Needle for dose and use information.	
/31065AA	**Chrysanthemum**		
FBAABAW	Botrytis blight		
FMBCSBL	Leaf spot (Septoria)		
		Refer to Adam's Needle for dose and use information.	
/34045AA	**Cotoneaster**		
FBAABAW	Botrytis blight		
		Refer to Adam's Needle for dose and use information.	
/31093AA	**Easter Lily**		
FBAABAW	Botrytis blight		
		Refer to Adam's Needle for dose and use information.	

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/34052AA	English Ivy		
FMZCXAA	Bacterial leaf spot (Xanthomonas)		
		Refer to Adam's Needle for dose and use information.	
/34053AA	Euonymus		
FAAACDP	Anthracnose (Colletotrichum)		
FBAABAW	Botrytis blight		
		Refer to Adam's Needle for dose and use information.	
/31111AA	Gladiolus		
FBAABAW	Botrytis blight		
		Refer to Adam's Needle for dose and use information.	
/34106AA	Pachysandra		
FBBJVAL	Volutella leaf and stem blight		
		Refer to Adam's Needle for dose and use information.	
/34109AA	Periwinkle		
FDABPBU	Canker and dieback (Phomopsis)		
		Refer to Adam's Needle for dose and use information.	
/34058AA	Pyracantha		
FBANEBI	Fire blight (Erwinia)		
FEAJFAM	Scab (Fusicladium)		
		Refer to Adam's Needle for dose and use information.	

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/34120AA	Rose		
FMAEDBS	Black spot (Diplocarpon)		
FFACQBB	Powdery mildew		
		Refer to Adam's Needle for dose and use information.	
/35191AA	Live Oak		
PFOABBB	Ball moss	3.0-3.04 lb/ 100 gal (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.5 oz/gal (1 lb/gal FlC)	Use limited to TX. Foliar application. Apply in spring after heavy rain using 1.5 gallons of spray per foot of tree height. Make sure to wet tufts thoroughly. A second application may be required after 12 months.
/31155AA	Philodendron		
FMBCXAA	Bacterial leaf spot (Xanthomonas)	0.75-0.76 lb/ 100 gal (50% WP) (2 lb/gal, 3.04 lb/gal FlC) or 0.125 oz/gal (1 lb/gal FlC)	Foliar application. Tank mix with 1.2 pounds active ingredient mancozeb per 100 gallons water. Apply weekly before disease appears.
/35119AA	Sycamore		
FAAAGAT	Anthracnose (Gnomonia)	1.0-1.52 lb/ 100 gal (50% WP) (3.04 lb/gal FlC) or 0.16-0.25 oz/ gal (1 lb/gal FlC)	Foliar application. Apply as a full cover spray first at bud crack and again 7 to 14 days later at 10 percent leaf expansion.

COPPER HYDROXIDE

Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations

AERIAL AND TANK MIX APPLICATIONS

9001500
AAAAAAA

Aerial Application

--

Refer to
TERRESTRIAL FOOD CROP
(Agricultural Crops)
All sites except Grapes and Hops

9900300
AAAAAAA

Tank Mix

--

Refer to
TERRESTRIAL FOOD CROP
(Agricultural Crops)
Peanuts, Tomato
TERRESTRIAL NON-FOOD CROP
(Ornamental Plants and Forest Trees)
Philodendron

Listing of Registered Pesticide Products by Formulation

&057.3001 57.3% metallic copper equivalent (90% copper hydroxide) technical chemical
copper hydroxide (023401)
008901-00012

&059.0001 59% metallic copper equivalent (88% copper hydroxide) technical chemical
copper hydroxide (023401)
045002-00002 048957-00016

&057.3002 57.3% metallic copper equivalent (88% copper hydroxide) formulation intermediate
copper hydroxide (023401)
008901-00005

&001.6003 1.6% metallic copper equivalent (2.5% copper hydroxide) dust
copper hydroxide (023401) plus sulfur (077501)
008901-00004

&002.6003 2.6% metallic copper equivalent (4.3% copper hydroxide) dust
copper hydroxide (023401)
008901-00003

&002.7003 2.7% metallic copper equivalent (4.15% copper hydroxide) dust
copper hydroxide (023401)
007001-00224

&004.3903 4.39%* metallic copper equivalent (6.74% copper hydroxide) dust
copper hydroxide (023401) plus endosulfan (079401)
000264-00365#
#jacket currently unavailable for review
*calculated value based on the ratio of metallic copper to copper hydroxide

&004.4006 4.4% metallic copper equivalent (6.76%* copper hydroxide) wettable powder
copper hydroxide (023401) plus sulfur (077501)
002124-00799
*calculated value based on the ratio of metallic copper to copper hydroxide

&004.5006 4.5% metallic copper equivalent (6.91%* copper hydroxide) wettable powder
copper hydroxide (023401) plus sulfur (077501)
002124-00797 002124-00801
*calculated value based on the ratio of metallic copper to copper hydroxide

&004.6006 4.6% metallic copper equivalent (7.06%* copper hydroxide) wettable powder
copper hydroxide (023401) plus sulfur (077501)
002124-00803
*calculated value based on the ratio of metallic copper to copper hydroxide

COPPER HYDROXIDE

Listing of Registered Pesticide Products by Formulation (continued)

6009.5006 9.5% metallic copper equivalent (14.59%* copper hydroxide) wettable powder
copper hydroxide (023401)
002124-00798
*calculated value based on the ratio of metallic copper to copper hydroxide

6009.9006 9.9% metallic copper equivalent (15.2%* copper hydroxide) wettable powder
copper hydroxide (023401)
002124-00796 002124-00800
*calculated value based on the ratio of metallic copper to copper hydroxide

6010.4006 10.4% metallic copper equivalent (15.97%* copper hydroxide) wettable powder
copper hydroxide (023401)
002124-00802
*calculated value based on the ratio of metallic copper to copper hydroxide

6020.0006 20% metallic copper equivalent (30.7% copper hydroxide) wettable powder
copper hydroxide (023401)
008901-00022

6032.0006 32% metallic copper equivalent (50% copper hydroxide) wettable powder
copper hydroxide (023401) plus sulfur (077501)
008901-00010

6050.0006 50% metallic copper equivalent (77% copper hydroxide) wettable powder
copper hydroxide (023401)
007001-00065 008901-00001 045002-00001 048957-00014

6204.4014 0.53 lb/gal or 4.4% metallic copper equivalent (6.75% copper hydroxide) flowable concentrate
copper hydroxide (023401) plus sulfur (077501)
001812-00215

6209.5014 1 lb/gal or 9.5% metallic copper equivalent (14.6% copper hydroxide) flowable concentrate
copper hydroxide (023401)
008901-00028

6213.4014 13.4% metallic copper equivalent (20.5% copper hydroxide) flowable concentrate
copper hydroxide (023401)
001812-00195

6219.5014 2 lb/gal or 19.5% metallic copper equivalent (30% copper hydroxide) flowable concentrate
copper hydroxide (023401)
008901-00007

COPPER HYDROXIDE

Listing of Registered Pesticide Products by Formulation (continued)

&219.5014 2.12 lb/gal or 19.5% metallic copper equivalent (30% copper hydroxide) flowable concentrate
copper hydroxide (023401)
008901-00017

&217.5014 17.5% metallic copper equivalent (27% copper hydroxide) flowable concentrate
copper hydroxide (023401)
008901-00008

&224.4014 3.04 lb/gal or 24.4% metallic copper equivalent (37.5% copper hydroxide) flowable concentrate
copper hydroxide (023401)
008901-00020 047916-00047

&201.9516 1.95%* metallic copper equivalent (3% copper hydroxide) liquid-ready to use
copper hydroxide (023401), cuprous oxide (025601) plus tributyltin fluoride (083112)
003073-00040
*calculated value based on the ratio of metallic copper to copper hydroxide

&203.9116 3.91%* metallic copper equivalent (6% copper hydroxide) liquid-ready to use
copper hydroxide (023401), cuprous oxide (025601) plus tributyltin fluoride (083112)
003073-00048 003073-00049
*calculated value based on the ratio of metallic copper to copper hydroxide

&204.5616 4.56%* metallic copper equivalent (7% copper hydroxide) liquid-ready to use
copper hydroxide (023401), cuprous oxide (025601) plus bis(tributyltin) oxide (083001)
003073-00050
*calculated value based on the ratio of metallic copper to copper hydroxide

&205.2116 5.21%* metallic copper equivalent (8% copper hydroxide) liquid-ready to use
copper hydroxide (023401) plus copper as metallic from cuprous and cupric oxide (042403)
003073-00034 003073-00035

Listing of Registered Pesticide Products by Formulation (continued)

&205.7316 5.73%* metallic copper equivalent (8.8% copper hydroxide) liquid-ready to use
copper hydroxide (023401) plus copper as metallic from cuprous and cupric oxide (042403)
003073-00016
*calculated value based on the ratio of metallic copper to copper hydroxide

&205.8616 5.86%* metallic copper equivalent (9% copper hydroxide) liquid-ready to use
copper hydroxide (023401) plus copper as metallic from cuprous and cupric oxide (042403)
003073-00002
*calculated value based on the ratio of metallic copper to copper hydroxide

&213.7016 13.7% metallic copper equivalent (21% copper hydroxide) liquid-ready to use
copper hydroxide (023401)
008901-00002

&214.2616 14.26%* metallic copper equivalent (21.9% copper hydroxide) liquid-ready to use
copper hydroxide (023401), cuprous oxide (025601) plus bis(tributyltin) oxide (083001)
001609-00011
*calculated value based on the ratio of metallic copper to copper hydroxide

&215.3016 15.3%* metallic copper equivalent (23.5% copper hydroxide) liquid-ready to use
copper hydroxide (023401), cuprous oxide (025601) plus bis(tributyltin) oxide (083001)
001609-00010
*calculated value based on the ratio of metallic copper to copper hydroxide

9999999 State Label Registrations

CA Reg. No.
007001-07765

FL Reg. No.
005095-03083 005095-07872 014775-08730 014775-08762
014775-08763

NY Reg. No.
038655-10434

COPPER HYDROXIDE

Listing of Registered Pesticide Products by Formulation (continued)

OR Reg. No.
001871-08961 002935-06563

TX Reg. No.
006735-04808

Appendix A

Listing of Common Chemical Names Used on the Entry

Chemical Code	Common Name (source)	EPA Acceptable Common/Chemical Name
014504	mancozeb (ISO)	zinc ion and manganese ethylene bisdithiocarbamate 80%, a coordination product of manganese 16%, zinc 2%, ethylene bisdithiocarbamate 62%
023401		copper hydroxide
025601		cuprous oxide
042403		copper as metallic from cuprous and cupric oxide
077501		sulfur
079401		endosulfan
083001		bis(tributyltin) oxide
083112		tributyltin fluoride

Listing by Site/Pest and Site/Formulation/Registration Number

TERRESTRIAL FOOD CROP

(Agricultural Crops)

/23001AA Alfalfa
FMBCCBM Cercospora leaf spot
FMBCLAT Leptosphaerulina leaf spot
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/03001AA Almond
FBAZPDZ Bacterial shoot blight (Pseudomonas)
FBADMCB Brown rot blossom blight (Monilinia)
FBAZCEL Shothole (Coryneum blight)
(20% WP)
008901-00022

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/04001AA Apple
FMAGPDZ Blister spot (Pseudomonas)
FDAANAF European canker (Nectria)
FBANEBI Fire blight (Erwinia)
FAAANAK Northwestern anthracnose (Neofabraea)
FDAGPCN Phytophthora collar rot
(50% WP)
007001-00065 008901-00001

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/05001AA **Apricot**
FBADMCB Brown rot blossom blight (Monilinia)
FBAZCEL Shothole (Coryneum blight)
(20% WP)
008901-00022

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28000AA **Avocado**
FEAJSCB Scab (spot anthracnose) (Sphaceloma)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/06002AA **Banana**
FIEQPOZ Black pitting (Piricularia grisea)
FMBOCBM Sigatoka disease (Cercospora leaf spot)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28063AA **Barley**
FCADHAM Helminthosporium leaf blotch
FMBCSBL Septoria leaf blotch
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

	Barley (continued)
	(1 lb/gal FlC)
	008901-00028
	(2 lb/gal FlC)
	008901-00007
	(3.04 lb/gal FlC)
	008901-00020 047916-00047
/28001AA	**Beans**
FBZFXAV	Bacterial blight (common) (Xanthomonas)
FBZRPGG	Halo blight (Pseudomonas)
	(50% WP)
	007001-00065 008901-00001 045002-00001 048957-00014
	(1 lb/gal FlC)
	008901-00028
	(2 lb/gal FlC)
	008901-00007
	(3.04 lb/gal FlC)
	008901-00020 047916-00047
	(17.5% FlC)
	008901-00008
/01002AA	**Blackberry**
FMAMMCO	Leaf and cane spot
FMAMSBL	(Mycosphaerella) (Septoria)
	(50% WP)
	007001-00065 008901-00001 045002-00001 048957-00014
	(1 lb/gal FlC)
	008901-00028
	(2 lb/gal FlC)
	008901-00007
	(3.04 lb/gal FlC)
	008901-00020 047916-00047
/13005AA	**Broccoli**
FFABPAU	Downy mildew (Peronospora)
	(50% WP)
	007001-00065 008901-00001 045002-00001 048957-00014

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Broccoli (continued)

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

/13006AA Brussels Sprouts
FFABPAU Downy mildew (Peronospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

/13007AA Cabbage
FIAFXAA Black rot (Xanthomonas)
FFABPAU Downy mildew (Peronospora)
FMBCAAX Leaf spot (Alternaria)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

(3.04 lb/gal FlC)
008901-00020 047916-00047

/10002AA Cantaloupe
FFABPEA Downy mildew (Pseudoperonospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

COPPER HYDROXIDE

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/28073AA **Carrots**
FBAMCBM Early blight (Cercospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/13008AA **Cauliflower**
FFABPAU Downy mildew (Peronospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28003AA **Celery**
FBAAPDZ Bacterial blight (Pseudomonas)
FBAMCBM Early blight (Cercospora)
FBASSBL Late blight (Septoria)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/05002AA **Cherry**
FBADMCB Brown rot blossom rot (Monilinia)
FBAAPDZ Dead bud (Pseudomonas)
FBAZCEL Shothole (Coryneum blight)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

Cherry (continued)

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/02000AA Citrus Fruits
FGAJPCN Brown rot gummosis (Phytophthora)
FMAYMCO Greasy spot (Mycosphaerella)
FIBLDAP Melanose (Diaporthe)
FMBIMCO Pink pitting (Mycosphaerella)
FAABEAH Scab (spot anthracnose) (Elsinoe)

(4.4% WP)
002124-00799

(4.5% WP)
002124-00797 002124-00801

(4.6% WP)
002124-00803

(9.5% WP)
002124-00798

(9.9% WP)
002124-00796 002124-00800

(10.4% WP)
002124-00802

(20% WP)
008901-00022

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/07001AA
FIFAPLG

Cocoa
Black pod (Phytophthora palmivora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/07002AA
FJAGHAO
FMBACBM
FGAOCEF

Coffee
Coffee leaf rust (Hemileia) (in Brazil)
Iron spot (Cercospora)
Pink disease (Corticium)
(2.7% D)
007001-00224

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/01010AA
FIBFQBB

Cranberry
Fruit rot
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/10010AA
FMABPDZ
FFABPEA

Cucumber
Angular leaf spot (Pseudomonas)
Downy mildew (Pseudoperonospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Cucumber (continued)

(3.04 lb/gal FlC)
008901-00020 047916-00047

/01011AA **Currant**
FMBCQBB Leaf spot
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/11001AA **Eggplant**
FAAACDP Anthracnose (Colletotrichum)
FBAMAAX Early blight (Alternaria)
FBAAPBU Phomopsis blight
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

/03005AA **Filbert**
FBAAXAA Bacterial blight (Xanthomonas)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/01013AA **Gooseberry**
FMBCQBB Leaf spot
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

Gooseberry (continued)

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/01014AA Grapes
FIBFGBG Black rot (Guignardia)
FFABPCV Downy mildew (Plasmopara)
FFACUAB Powdery mildew (Uncinula)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

/10005AA Honeydew Melons
FFABPEA Downy mildew (Pseudoperonospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/08020AA Hops
FFABPEA Downy mildew (Pseudoperonospora)
(50% WP)
007001-00065 008901-00001 045002-00001

(3.04 lb/gal FlC)
008901-00020 047916-00047

/13020AA **Lettuce**
FFABBBA Downy mildew (Bremia)
(50% WP)
008901-00001 045002-00001

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

/06007AA **Mango**
FAAAGAP Anthracnose (Glomerella)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/10006AA **Muskmelons**
FFABPEA Downy mildew (Pseudoperonospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/05003AA **Nectarines**
FMCBXAA Bacterial fruit and leaf spot (Xanthomonas)
FBADMCB Brown rot blossom blight (Monilinia)
FEAGTAB Leaf curl (Taphrina)
FBAZCEL Shothole (Coryneum blight)
(20% WP)
008901-00022

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

Nectarines (continued)

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28014AA Olive
FMBHCFK Peacock spot (Cycloconium)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/14011AA Onion
FFABPAU Downy mildew (Peronospora)
FCAEAAX Purple blotch (Alternaria)
(50% WP)
007001-00065 008901-00001 045002-00001

(1 lb/gal FlC)
008901-00028

(3.04 lb/gal FlC)
008901-00020 047916-00047

/05004AA Peaches
FMCBXAA Bacterial fruit and leaf spot (Xanthomonas)
FBADMCB Brown rot blossom blight (Monilinia)
FEAGTAB Leaf curl (Taphrina)
FBAZCEL Shothole (Coryneum blight)
(20% WP)
008901-00022

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

Peaches (continued)

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28015AA Peanuts
FMBCCBM Cercospora leaf spot
(1.6% D)
008901-00004

(2.6% D)
008901-00003

(32% WP)
008901-00010

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(0.53 lb/gal FlC)
001812-00215

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

(13.4% FlC)
001812-00195

(17.5% FlC)
008901-00008

(13.7% RTU)
008901-00002

/04003AA Pear
FMAHPDZ Bacterial blast (Pseudomonas)
FBANEBI Fire blight (Erwinia)
(2.6% D)
008901-00003

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Pear (continued)

(2.7% D)
007001-00224

(20% WP)
008901-00022

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28016AA
FFACEBJ
Peas
Powdery mildew (Erysiphe)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

(17.5% FlC)
008901-00008

/28017AA
FMAAXAA
Peppers
Bacterial spot (Xanthomonas)
(2.7% D)
007001-00224

(50% WP)
007001-00065 008901-00001 045002-00001

(1 lb/gal FlC)
008901-00028

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Peppers (continued)

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

(17.5% FlC)
008901-00008

/14013AA Potato
FBAMAAX Early blight (Alternaria)
FBASPCN Late blight (Phytophthora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/10011AA Pumpkin
FEAJCCV Powdery mildew (Erysiphe)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/10012AA Squash
FEAJCCV Powdery mildew (Erysiphe)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Squash (continued)

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/01016AA Strawberry
FBATDAH Leaf blight (Dendrophoma)
FMBCMCO Leaf spot (Mycosphaerella)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28020AA Sugar Beets
FMBCCBM Leaf spot (Cercospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

(17.5% FlC)
008901-00008

(13.7% RTU)
008901-00002

/11005AA Tomato
FMBPPDZ Bacterial speck (Pseudomonas)
FMAAXAA Bacterial spot (Xanthomonas)
FBAMAAX Early blight (Alternaria)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Tomato (continued)

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

(17.5% FlC)
008901-00008

/03009AA Walnut
FBZAXAA Walnut blight (Xanthomonas)
(20% WP)
008901-00022

(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/10008AA Watermelons
FAAACDP Anthracnose (Colletotrichum)
FFABPEA Downy mildew (Pseudoperonospora)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/28065AA Wheat
FCADHAM Helminthosporium leaf blotch
FMBCSBL Septoria leaf blotch
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Wheat (continued)

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

(Agricultural Seed Treatment)

/28063AA Barley
Bacterial leaf blight (Pseudomonas syringae)
Bacterial leaf streak (Xanthomonas translucens)
FLATTAQ Common bunt (Tilletia caries)
(2.12 lb/gal or 19.5% FlC)
008901-00017

/28072AA Rice
FKABADD Seed rot
FKABPES (Achlya) (Pythium)
(2.12 lb/gal or 19.5% FlC)
008901-00017

/28065AA Wheat
Bacterial leaf blight (Pseudomonas syringae)
Bacterial leaf streak (Xanthomonas translucens)
FLATTAQ Common bunt (Tilletia caries)
(2.12 lb/gal or 19.5% FlC)
008901-00017

TERRESTRIAL NON-FOOD CROP

(Ornamental Plants and Forest Trees)

/34147AA Adam's Needle
FMBCCBM Leaf spot (Cercospora)
FMBCSBL Leaf spot (Septoria)
(1 lb/gal FlC)
008901-00028

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/34018AA	**Aralia**
FMBCAAX	Leaf spot (Alternaria)
FMBCCBM	Leaf spot (Cercospora)
FMBCXAA	Leaf spot (Xanthomonas)
	(1 lb/gal FlC)
	008901-00028
/34022AA	**Azalea**
FBADBAW	Botrytis blossom blight
FBBJBAW	Botrytis leaf and stem blight
FMBCCBM	Leaf spot (Cercospora)
FDACPCN	Phytophthora dieback
FFACQBB	Powdery mildew
	(1 lb/gal FlC)
	008901-00028
/31034AA	**Begonia**
FAAAGAN	Anthracnose (leaf spot) (Gloeosporium)
FMZCXAA	Bacterial leaf spot (Xanthomonas)
	(1 lb/gal FlC)
	008901-00028
/31057AA	**Carnation**
FBATAAX	Alternaria blight (leaf spot)
FMZCPDZ	Bacterial leaf spot (Pseudomonas)
FBAABAW	Botrytis blight
	(1 lb/gal FlC)
	008901-00028
/31065AA	**Chrysanthemum**
FBAABAW	Botrytis blight
FMBCSBL	Leaf spot (Septoria)
	(1 lb/gal FlC)
	008901-00028
/34045AA	**Cotoneaster**
FBAABAW	Botrytis blight
	(1 lb/gal FlC)
	008901-00028
/31093AA	**Easter Lily**
FBAABAW	Botrytis blight
	(1 lb/gal FlC)
	008901-00028
/34052AA	**English Ivy**
FMZCXAA	Bacterial leaf spot (Xanthomonas)
	(1 lb/gal FlC)
	008901-00028

/34053AA Euonymus
FAAACDP Anthracnose (Colletotrichum)
FBAABAW Botrytis blight
(1 lb/gal FlC)
008901-00028

/31111AA Gladiolus
FBAABAW Botrytis blight
(1 lb/gal FlC)
008901-00028

/35191AA Live Oak
PFOABBB Ball moss
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

/34106AA Pachysandra
FBBJVAL Volutella leaf and stem blight
(1 lb/gal FlC)
008901-00028

/34109AA Periwinkle
FDABPBU Canker and dieback (Phomopsis)
(1 lb/gal FlC)
008901-00028

/31155AA Philodendron
FMBCXAA Bacterial leaf spot (Xanthomonas)
(50% WP)
007001-00065 008901-00001 045002-00001 048957-00014

(1 lb/gal FlC)
008901-00028

(2 lb/gal FlC)
008901-00007

(3.04 lb/gal FlC)
008901-00020 047916-00047

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/34058AA FBANEBI FEAJFAM	Pyracantha Fire blight (Erwinia) Scab (Fusicladium) (1 lb/gal FlC) 008901-00028
/34120AA FMAEDBS FFACQBB	Rose Black spot (Diplocarpon) Powdery mildew (1 lb/gal FlC) 008901-00028
/35119AA FAAAGAT	Sycamore Anthracnose (Gnomonia) (50% WP) 007001-00065 008901-00001 045002-00001 048957-00014 (1 lb/gal FlC) 008901-00028 (3.04 lb/gal FlC) 008901-00020 047916-00047
	AQUATIC NON-FOOD (Antifouling Treatments)
/690020A IAFAAAA	Boat Bottoms/Hulls (fiberglass) (primed/unprimed) Fouling organisms (1.95% RTU) 003073-00040 (3.91% RTU) 003073-00048 003073-00049 (4.56% RTU) 003073-00050 (5.21% RTU) 003073-00034 003073-00035 (5.73% RTU) 003073-00016 (5.86% RTU) 003073-00002

COPPER HYDROXIDE

CFR 40 Section 180.1001 - exemption from tolerance.

The ratio of metallic copper to copper hydroxide used to calculate formulations and dosages was primarily based on information from Reg. No. 8901-12 and 8901-5.

Currently dated (6/23/71) labeling for Reg. No. 3073-16 gives the percent of Kocide on the label (10%), not the percent of copper hydroxide (8.8%). The Agency has requested the necessary change by the registrant.

NOTE: For all labels with Philodendron, a tank mix with mancozeb is recommended. There do not seem to be any current mancozeb labels that claim control of Bacterial leaf spot on Philodendron. Perhaps other data exists.

FINAL
MAI/MAI
c076102

COPPER NITRATE*

TYPE PESTICIDE: Fungicide, Antimicrobial

FORMULATIONS: RTU (0.04%, 0.6%)

GENERAL WARNINGS AND LIMITATIONS: Formulations may cause irritation of skin. In case of contact, wash with water. Undiluted formulations will become unstable and less active if allowed to contact iron, copper, bronze, tin, brass, aluminum, lead, zinc or chrome.
Dosage rates and formulations are given in metallic copper equivalent.
Definition of Terms:
MAI - multiple active ingredients
ppm - parts per million

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	AQUATIC NON-FOOD		
	(Aquatic Sites)		
/65028MA /65034MA /65029MA	Heat Exchanger Water Systems Industrial Ponds and Reservoirs Industrial Processing Water		Clean heavily contaminated systems prior to treatment.
DBABAAA FYAFQBB	Slime-forming bacteria Slime-forming fungi	[MAI] 0.008-0.032 oz/10,000 gal water or 0.006-0.024 ppm (0.6% RTU)	Water treatment. Slug feed initially. For systems that are not highly contaminated, treatment should be made at a location just after a pump where turbulence or high velocity flow takes place. Repeat slug treatment after 1 week. The makeup water should be treated at the low rate. Formulated with silver nitrate.
/65019MA	Industrial Water Cooling Tower Systems		Clean heavily contaminated systems prior to treatment.
DBABAAA FYAFQBB	Slime-forming bacteria Slime-forming fungi	[MAI] 0.008-0.032 oz/10,000 gal water or 0.006-0.024 ppm (0.6% RTU)	Water treatment. Slug feed initially. Repeat after 1 week. The make-up water should be treated at the low rate. Formulated with silver nitrate.

*cupric nitrate

COPPER NITRATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/65008MA	Pulp and Paper Mill Systems		May be used as a slimicide in the manufacture of paper and paperboard that contact food in accordance with prescribed conditions (CFR 21, Indirect Food Additives, Section 176.300).
DBABAAA FYAFQBB	Slime-forming bacteria Slime-forming fungi	[MAI] General machine treatment: 0.0015-0.03 ppm by weight of furnish or Broke: 0.006-0.06 ppm by weight of broke (0.6% RTU)	Water treatment. General machine treatment. Continuous feed by pump. Add at 1 or more places, such as the beater, hydropulper, before or after the refiners, storage chests, machine chest, head box wire pit and fan pump. As an alternative, slug feed using equivalent amounts added at intervals. OR Broke. In some mills, treatment is based on the highly contaminated broke system. The amount added depends upon the microbiological contamination. For highly contaminated systems start at the higher dose level then reduce toward the lower end of the range as control is achieved. Formulated with silver nitrate.
		[MAI] -- (0.04% RTU)	Water treatment. Formulated with silver nitrate.

COPPER NITRATE

Listing of Registered Pesticide Products by Formulation

&200.0416 0.04% liquid-ready to use
copper nitrate (076102) plus silver nitrate (072503)
004855-00006

&200.6016 0.6% liquid-ready to use
copper nitrate (076102) plus silver nitrate (072503)
004855-00004

COPPER NITRATE

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number

AQUATIC NON-FOOD

(Aquatic Sites)

/65028MA	Heat Exchanger Water Systems
DBABAAA	Slime-forming bacteria
FYAFQBB	Slime-forming fungi
	(0.6% RTU)
	004855-00004
/65034MA	Industrial Ponds and Reservoirs
DBABAAA	Slime-forming bacteria
FYAFQBB	Slime-forming fungi
	(0.6% RTU)
	004855-00004
/65029MA	Industrial Processing Water
DBABAAA	Slime-forming bacteria
FYAFQBB	Slime-forming fungi
	(0.6% RTU)
	004855-00004
/65019MA	Industrial Water Cooling Tower Systems
DBABAAA	Slime-forming bacteria
FYAFQBB	Slime-forming fungi
	(0.6% RTU)
	004855-00004
/65008MA	Pulp and Paper Mill Systems
DBABAAA	Slime-forming bacteria
FYAFQBB	Slime-forming fungi
	(0.04% RTU)
	004855-00006
	(0.6% RTU)
	004855-00004

EPA Index to Pesticide Chemicals

COPPER NITRATE

Auxiliary Documentation

Please note that the Shaughnessy number 076102 includes cupric nitrate as a synonym for copper nitrate. The Acceptable Chemical Names book ('Blalock'), however, gives a separate accession number for each name. Ostensibly, this means both names should appear on the label.

Concerning Reg. No. 4855-4:

Density is 8.75 lb/gal, or 0.84 oz/gal of metallic copper.

The Pulp and Paper Mill entry is derived from the last correspondence (on 9/28/72) by the Agency to the registrant (see attachment to label).

Please also note the slightly different caution statements of the labels:

4855-4 - May cause temporary discoloration and/or mild irritation of skin. In case of contact, wash with water.

4855-6 - May cause irritation of skin and eyes. In case of contact, wash with water.

FINAL
SAI/SAI
c023305

COPPER OXALATE*

TYPE PESTICIDE: Repellent

FORMULATIONS: D (4%)

GENERAL WARNINGS AND LIMITATIONS: The dosage and formulation are given in active ingredient (copper oxalate).

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL FOOD CROP		
	(Agricultural Crops)		
/28005AA	Corn		(See Auxiliary Documentation for tolerance information). Seed treatment through 0.32 ounce per bushel. Do not use treated seed for food or feed purposes.
VIVFABA	Crows	0.32 oz/bu seed (4% D)	Seed treatment. Mix in a suitable container with seed until all seed is colored. Seed may be planted immediately or stored.

*cupric oxalate

COPPER OXALATE

Listing of Registered Pesticide Products by Formulation

&004.0003 4% dust
copper oxalate (023305)
007832-00002

9999999 State Label Registration

CA Reg. No.
011117-06024

COPPER OXALATE

AUXILIARY DOCUMENTATION

No tolerance can be located in CFR 40.

Please note that the formulation is colored.

FINAL
SAI/SAI
c023501

COPPER OXYCHLORIDE

TYPE PESTICIDE: Fungicide

FORMULATIONS:
Tech (58.1%)
WP (47%, 50%, 53%)
FlC (20.58%)

GENERAL WARNINGS AND LIMITATIONS: Dosages and formulations are given in metallic copper equivalents. The percent of copper oxychloride for each label is given in the Listing of Registered Pesticide Products by Formulation (page 6).

TERRESTRIAL FOOD CROP

(Agricultural Crops)

General Warnings and Limitations: Apply for thorough coverage using dilute or concentrate ground equipment or by aircraft.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28073AA	Carrots		Exempt No preharvest interval through 21.25 pounds per acre.
FBAMCBM	Early blight (Cercospora)	1.41-2.125 lb/A (47%, 50%, 53% WP)	Foliar application. Apply when disease is first reported in area. Repeat at 7 to 10 day intervals as needed.
FBASAAX	Late blight (Alternaria)		
/28003AA	Celery		Exempt No preharvest interval through 3.29 pounds per acre. Remove residues by washing and stripping.
FBAMCBM	Early blight (Cercospora)	1.41-3.29 lb/A (47%, 50%, 53% WP)	Foliar application. Apply when plants are 2 to 3 inches tall or before disease appears. Repeat at 5 to 14 day intervals.
FBASSBL	Late blight (Septoria)		

COPPER OXYCHLORIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/02000AA	Citrus Fruits		Exempt No preharvest interval through 3.18 pounds per acre. Do not use in areas where copper injury is known to occur or where fumigation with hydrogen cyanide is practiced.
FMAYMCO	Greasy spot (Mycosphaerella)	3.125 lb/A (50% WP)	Dormant and foliar application. Apply beginning in dormant season. Repeat at two-thirds petal fall, when fruit is 0.5 inch in diameter and as needed thereafter.
FIBLDAP	Melanose (Diaporthe)		
FAABEAH	Scab (spot anthracnose) (Elsinoe)		
		2.35-3.055 lb/500 gal/A (47% WP)	Use limited to FL. Dormant and foliar application. Apply in dormant season before spring flush. Repeat within 2 weeks after petal fall. For melanose and scab, repeat in 4 weeks at low rate.
		3.18 lb/500 gal (53% WP)	Dormant and foliar application. Apply in dormant season before spring growth. Repeat 1 to 3 weeks after petal fall. For melanose and scab, repeat in 4 weeks.
/10010AA /10001AA	Cucumber Melons		Exempt No preharvest interval through 2.12 pounds per acre.
FMABPDZ	Angular leaf spot (Pseudomonas)	2.12 lb/A (53% WP)	Foliar application. Apply when disease is first reported in area. Repeat at 7 to 10 day intervals as needed.
FAAACDP	Anthracnose (Colletotrichum)		
FFABPEA	Downy mildew (Pseudoperonospora)		
FEAJCCV	Scab (Cladosporium)		
/10008AA	(watermelons)		
FFABPEA	Downy mildew (Pseudoperonospora)	0.72 lb/100 gal/A (20.58% FlC)	Use limited to FL. Foliar application. Apply before disease appears. Repeat at 6 to 10 day intervals as needed.
FBAQMCO	Gummy stem blight (Mycosphaerella)		

COPPER OXYCHLORIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/05004AA	Peach		Exempt Do not apply after petal fall through 2.125 pounds per 100 gallons.
FEAGTAB	Leaf curl (Taphrina)	2.125 lb/100 gal (50% WP)	Foliar application. Apply in bloom and petal fall.
		2.12 lb/100 gal (53% WP)	Delayed dormant and foliar application. Apply at prebloom to petal fall.
/28015AA	Peanuts		Exempt No preharvest interval through 0.72 pound per acre.
FMBCCBM	Cercospora leaf spot	0.72 lb/5-20 gal/A (20.58% FlC)	Foliar application. Apply as soon as first leaf spots are observed. Repeat at 10 to 14 day intervals as needed.
/28017DA /28017CA	Peppers (transplants in cold frames, greenhouses, etc.)		Exempt
FKAAQBB	Damping-off	2.125 lb/100 gal (50% WP)	Soil application to transplants. Apply as a light spray to soil around plants. Apply when plants emerge and repeat at 4 to 7 day intervals until transplanting.
		2.12 lb/100 gal or 1.06 oz/3 gal (53% WP)	Apply as above except also spray plants lightly but thoroughly.
/14013AA	Potato		Exempt No preharvest interval through 3.71 pounds per acre.
FBAMAAX FBASPCN	Early blight (Alternaria) Late blight (Phytophthora)	1.41-3.71 lb/A (47%, 50%, 53% WP)	Foliar application. Apply before disease appears. Repeat at 7 to 10 day intervals as needed. Apply high rate at 7 day intervals if late blight infection is severe on large plants.

COPPER OXYCHLORIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28020AA	Sugar Beets		Exempt No preharvest interval through 3.18 pounds per acre.
FMBCCBM	Leaf spot (Cercospora)	3.0-3.18 lb/A (50%, 53% WP)	Foliar application. Apply before disease appears. Repeat at 7 to 10 day intervals.
		1.88 lb/A (47% WP)	Foliar application. Apply when disease symptoms first appear. Repeat at 7 to 10 day intervals for as long as disease threatens.
/11005AA	Tomato		Exempt No preharvest interval through 3.71 pounds per acre.
FMAAXAA	Bacterial spot (Xanthomonas)	2.65-3.18 lb/A (53% WP)	Foliar application. In seed beds, apply after the first leaves appear at 5 to 6 day intervals. In the field, apply if disease is expected at 5 to 7 day intervals. Use the shorter interval during periods of rainy weather.
FBAMAAX FBASPCN FMBCSBL	Early blight (Alternaria) Late blight (Phytophthora) Leaf spot (Septoria)	1.41-3.71 lb/A (47%, 50%, 53% WP)	Foliar application. Apply before disease appears. Repeat at 7 to 14 day intervals. If late blight is severe, apply at high rate on large plants.
/11005DA /11005CA	(tomato (transplants in cold frames, greenhouses, etc.))		
FKAAQBB	Damping-off	2.125 lb/100 gal (50% WP)	Soil application to transplants. Apply as a light spray to soil around plants. Apply when plants emerge and repeat at 4 to 7 day intervals until transplanting.
		2.12 lb/100 gal or 1.06 oz/3 gal (53% WP)	Apply as above except also spray plants lightly but thoroughly.

COPPER OXYCHLORIDE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL NON-FOOD CROP		
	(Ornamental Plants and Forest Trees)		
/34022AA	Azalea		
FBAIBBC	Bud and twig blight (Briosia)	2.12 lb/100 gal (53% WP)	Foliar application. Apply when disease is first reported in area. Repeat at 7 to 10 day intervals or as needed.
/34109AA	Periwinkle		
FDABPBU	Canker (dieback) (Phomopsis)	2.12 lb/100 gal (53% WP)	Foliar application. Apply when disease is first reported in area. Repeat at 7 to 10 day intervals or as needed.
	GREENHOUSE FOOD CROP		
	(Agricultural Crops)		
/28017CA	Peppers		
		Refer to TERRESTRIAL FOOD CROP, (Agricultural Crops), Peppers (transplants in cold frames, greenhouses, etc.) for use and limitation information.	
/11005CA	Tomato		
		Refer to TERRESTRIAL FOOD CROP, (Agricultural Crops), Tomato (transplants in cold frames, greenhouses, etc.) for use and limitation information.	
	AERIAL AND TANK MIX APPLICATIONS		
9001500 AAAAAAA	Aerial Application		
	--	Refer to TERRESTRIAL FOOD CROP (Agricultural Crops)	All sites except Cucumber, Melons, Peppers (transplants), Tomato, and Tomato (transplants)

COPPER OXYCHLORIDE

Listing of Registered Pesticide Products by Formulation

&058.1001 58.1% metallic copper equivalent (98.75% copper oxychloride) technical chemical
copper oxychloride (023501)
000279-02811

&047.0006 47% metallic copper equivalent (80% copper oxychloride) wettable powder
copper oxychloride (023501)
007969-00027

&050.0006 50% metallic copper equivalent (85.03%* copper oxychloride) wettable powder
copper oxychloride (023501)
007001-00256
*calculated value based on the ratio of metallic copper to copper oxychloride

&053.0006 53% metallic copper equivalent (90.14%* copper oxychloride) wettable powder
copper oxychloride (023501)
000279-02797
*calculated value based on the ratio of metallic copper to copper oxychloride

&220.5814 20.58%* metallic copper equivalent (35% copper oxychloride) flowable concentrate
copper oxychloride (023501)
048273-00002
*calculated value based on the ratio of metallic copper to copper oxychloride

9999999 State Label Registration

OR Reg. No.
001871-08960

Listing by Site/Pest and Site/Formulation/Registration Number

TERRESTRIAL FOOD CROP

(Agricultural Crops)

/28073AA	Carrots
FBAMCBM	Early blight (Cercospora)
FBASAAX	Late blight (Alternaria)
	(47% WP)
	007969-00027
	(50% WP)
	007001-00256
	(53% WP)
	000279-02797
/28003AA	Celery
FBAMCBM	Early blight (Cercospora)
FBASSBL	Late blight (Septoria)
	(47% WP)
	007969-00027
	(50% WP)
	007001-00256
	(53% WP)
	000279-02797
/02000AA	Citrus Fruits
FMAYMCO	Greasy spot (Mycosphaerella)
FIBLDAP	Melanose (Diaporthe)
FAABEAH	Scab (spot anthracnose) (Elsinoe)
	(47% WP)
	007969-00027
	(50% WP)
	007001-00256
	(53% WP)
	000279-02797
/10010AA	Cucumber
FMABPDZ	Angular leaf spot (Pseudomonas)
FAAACDP	Anthracnose (Colletotrichum)
FFABPEA	Downy mildew (Pseudoperonospora)
FEAJCCV	Scab (Cladosporium)
	(53% WP)
	000279-02797

COPPER OXYCHLORIDE

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/10001AA	Melons
FMABPDZ	Angular leaf spot (Pseudomonas)
FAAACDP	Anthracnose (Colletotrichum)
FFABPEA	Downy mildew (Pseudoperonospora)
FEAJCCV	Scab (Cladosporium)
	(53% WP)
	000279-02797
/10008AA	(watermelons)
FFABPEA	Downy mildew (Pseudoperonospora)
FBAQMCO	Gummy stem blight (Mycosphaerella)
	(20.58% FlC)
	048273-00002
/05004AA	Peach
FEAGTAB	Leaf curl (Taphrina)
	(50% WP)
	007001-00256
	(53% WP)
	000279-02797
/28015AA	Peanuts
FMBCCBM	Cercospora leaf spot
	(20.58% FlC)
	048273-00002
/28017DA	Peppers (transplants in cold frames, greenhouses, etc.)
FKAAQBB	Damping-off
	(50% WP)
	007001-00256
	(53% WP)
	000279-02797
/14013AA	Potato
FBAMAAX	Early blight (Alternaria)
FBASPCN	Late blight (Phytophthora)
	(47% WP)
	007969-00027
	(50% WP)
	007001-00256
	(53% WP)
	000279-02797

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/28020AA Sugar Beets
FMBCCBM Leaf spot (Cercospora)
(47% WP)
007969-00027

(50% WP)
007001-00256

(53% WP)
000279-02797

/11005AA Tomato
FMAAXAA Bacterial spot (Xanthomonas)
FBAMAAX Early blight (Alternaria)
FBASPCN Late blight (Phytophthora)
FMBCSBL Leaf spot (Septoria)
(47% WP)
007969-00027

(50% WP)
007001-00256

(53% WP)
000279-02797

/11005DA (tomato (transplants in cold frames, greenhouses, etc.))
FKAAQBB Damping-off
(50% WP)
007001-00256

(53% WP)
000279-02797

TERRESTRIAL NON-FOOD CROP

(Ornamental Plants and Forest Trees)

/34022AA Azalea
FBAIBBC Bud and twig blight (Briosia)
(53% WP)
000279-02797

/34109AA Periwinkle
FDABPBU Canker (dieback) (Phomopsis)
(53% WP)
000279-02797

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

GREENHOUSE FOOD CROP

(Agricultural Crops)

/28017CA
FKAAQBB

Peppers
  Damping-off
(50% WP)
  007001-00256

(53% WP)
  000279-02797

/11005CA
FKAAQBB

Tomato
  Damping-off
(50% WP)
  007001-00256

(53% WP)
  000279-02797

COPPER OXYCHLORIDE

CFR 40 Section 180.1001 - exemption from tolerance.

The percentage of metallic copper in copper oxychloride (58.8%) was calculated based on information from Reg. Nos. 279-2811 and 7969-27.

Dosages from Reg. No. 48273-2 for peanuts and watermelons were based on label information that indicated 2.5 pints of product are about equal to 3.5 pounds.

No reference in the literature for the use of copper oxychloride for Bacterial spot (Xanthomonas) could be located.

FINAL
SAI/MAI
023503

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COPPER OXYCHLORIDE SULFATE

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c023503 COPPER OXYCHLORIDE SULFATE

TYPE PESTICIDE: Fungicide

FORMULATIONS:
Tech (56%, 57%)
D (3%, 6%, 15%)
WP (15.23%, 20%, 24%, 33.3%, 50%, 53%, 55%)
WP/D (6%)

GENERAL WARNINGS AND LIMITATIONS: Compatible with most other fungicides and/or insecticides except lime sulfur and dithiocarbamates.
Dosages and formulations are given in metallic copper equivalents.
May be applied by ground equipment or aircraft.
Observe all warnings and limitations for other active ingredients in multiple active ingredient labels and when oil is added to the spray.
Do not enter treated areas until sprays or dusts have dried or settled.
Definition of Terms:
MAI - multiple active ingredient(s)
max. - maximum

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL FOOD CROP		
	(Agricultural Crops)		
/03001AA	Almond		Exempt Apply through 2.12 pounds per 100 gallons; or 8.48 pounds per acre in CA. Do not apply after petal fall.
FBADMCB FBAZCEL	Brown rot blossom blight (Monilinia) Shothole (Coryneum blight)	1.0-2.12 lb/ 100 gal (50%, 53% WP) or 2.4-3.0 lb/A (6% D)	Dormant, delayed dormant, and foliar applications. For brown rot, apply 2.0 to 2.12 pounds per 100 gallons in prebloom and petal fall stages. For shothole, apply 1.0 to 2.12 pounds per 100 gallons with 1.5 to 2 gallons of a suitable emulsion as a fall spray, in bud swell, and at petal fall. --OR MAI--
		[MAI] 2.4-3.0 lb/A (6% D)	Formulated with sulfur.

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/04001AA	**Apple**		Exempt Apply once through 2.0 pounds per 100 gallons no later than 0.5 inch green tip. No preharvest interval through 0.333 pound per 100 gallons with hydrated lime. Apply through 3.445 pounds per acre no later than late secondary bloom.
FCAAPCE FBANEBI	Blotch (Phyllosticta) Fire blight (Erwinia)	0.125 lb/100 gal (50% WP) or 0.6-1.8 lb/A (3%, 6% D)	Foliar application. Apply when 20 percent of the blossoms are open. Repeat when 75 percent of blossoms are open. For dust formulations, the number of applications will be determined by the length of the bloom period. --OR MAI--
		[MAI] 0.9-1.8 lb/A (3%, 6% D)	Formulated with sulfur.
FMAIMCO	Brook's fruit spot (Mycosphaerella)	0.25-0.333 lb/100 gal (50% WP)	Foliar application. Add 1 to 1.5 pounds of hydrated lime. Apply in cover sprays.
FBANEBI	Fire blight (Erwinia)	0.125-0.13 lb/100 gal [max. 3.445 lb/A] (50%, 53% WP)	Foliar application. Apply in full bloom, petal fall, and late secondary bloom.
		1.0-2.0 lb/ 100 gal (50% WP)	Delayed dormant application. Apply once as a full cover spray between silver tip and green tip. Do not apply at this rate when green tip exceeds 0.5 inch, as phytotoxicity may occur.
FEAJVAG	Scab (Venturia)	0.9-1.8 lb/A (6% D)	Delayed dormant and foliar applications. Apply in prebloom and bloom. The number of applications will be determined by the length of the bloom period. --OR MAI--
		[MAI] 0.9-1.8 lb/A (3%, 6% D)	Formulated with sulfur.

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/05001AA	Apricot		Exempt See dosage limits below.
FBADMCB	Brown rot blossom blight (Monilinia)	2.0-2.385 lb/100 gal (50%, 53% WP) or 2.4-3.0 lb/A (6% D)	Delayed dormant and foliar application. Apply in prebloom, bloom, and at petal fall.
FEAGTAB	Leaf curl (Taphrina)	2.0 lb/100 gal (50% WP)	Dormant application. Apply just before fall rain. Repeat in spring while trees are still dormant.
FBAZCEL	Shothole (Coryneum blight)	2.0-2.5 lb/100 gal [max. 15.9 lb/A] (50%, 53% WP) or 2.4-3.0 lb/A (6% D)	Dormant and delayed dormant application. Apply as a fall dormant spray and in the spring at red bud.
		1.375-2.4 lb/100 gal (20%, 24%, 50% WP)	Dormant and delayed dormant application. Add a suitable dormant flowable oil emulsion. Apply as a fall dormant spray and in the spring at red bud.
		6.0-6.36 lb/A (24%, 50% WP)	Use limited to CA. Dormant application. Add 6 gallons of a suitable dormant oil emulsion. Apply as a dormant spray up to bud swell.
		5.75-5.76 lb/60-90 gal/A (24%, 50% WP)	Delayed dormant and foliar application. Apply with concentrate ground equipment from prebloom to petal fall.
/28001AA	Beans		Exempt No preharvest interval through 2.12 pounds per acre.
FFABPCN	Downy mildew (Phytophthora)	0.5-2.12 lb/A (50%, 53% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply when disease threatens. Repeat as needed.
FMBJQBB	Pod spot		

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/28002AA	Beets		Exempt No preharvest interval through 1.325 pounds per acre.
FBAAQBB FMBCQBB	Blight Leaf spot	1.25-1.325 lb/A (50%, 53% WP)	Foliar application. Apply before disease appears. Repeat at 7 to 14 day intervals during growing season.
/01002AA /01003AA /01005AA /01006AA	Blackberry Boysenberry Loganberry Raspberry		Exempt See dosage limits below.
FAAAEAH FMBCSBL	Anthracnose (Elsinoe) Leaf spot (Septoria)	1.25 lb/100 gal (50% WP)	Delayed dormant and foliar applications. Apply when buds begin to open, when flower buds show white, and then at 10 to 14 day intervals as needed.
FJACKAH FMALSBL	Cane rust (yellow rust) (Kuehneola) Cane spot (Septoria)	0.875-3.18 lb/100 gal [max. 3.18 lb/A] (50%, 53% WP) or 3.0 lb/A (6% D)	Delayed dormant, foliar, and postharvest applications. Apply when new laterals are leafing out. Repeat when flowers begin to open and again as a postharvest spray after pruning but prior to fall rains.
	Boysenberry		See Blackberry cluster.
/13005AA /13006AA /13007AA /13008AA	Broccoli Brussels Sprouts Cabbage Cauliflower		Exempt No preharvest interval through 1.99 pounds per 100 gallons.
FFABPAU	Downy mildew (Peronospora)	1.5-1.99 lb/100 gal (50%, 53% WP)	Foliar application. Apply at 7 to 10 day intervals to protect new growth throughout the growing season.
	Brussels Sprouts		See Broccoli cluster.
	Cabbage		See Broccoli cluster.

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/10002AA	Cantaloupe		Exempt No preharvest interval through 3.0 pounds per acre.
/10010AA	Cucumber		
/10000AA	Cucurbits		
/10001AA	Melons		
/10011AA	Pumpkins		
/10012AA	Squash		
/10008AA	Watermelons		
FMABPDZ	Angular leaf spot (Pseudomonas)	1.0-2.2 lb/A (50%, 53%, 55% WP) or 1.5-2.0 lb/100 gal (33.3%, 50% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply when plants emerge or are established, or when disease is first reported in the area. Repeat at 5 to 10 day intervals throughout the growing season. --OR MAI--
FAAACDP	Anthracnose (Colletotrichum)		
FGZTEBI	Bacterial wilt (Erwinia)		
FFABPEA	Downy mildew (Pseudoperonospora)		
FBAQMCO	Gummy stem blight (Mycosphaerella)		
FBATAAX	Leaf blight (Alternaria)	[MAI] 1.2-3.0 lb/A [dust] or 1.2-3.0 lb/100 gal/A (6% WP/D) or 1.5-1.98 lb/A (6% D)	Formulated with rotenone; or endosulfan.
FMBCCBM	Leaf spot (Cercospora)		
FFACEBJ	Powdery mildew (Erysiphe)		
FEAJCCV	Scab (Cladosporium)		
FGZTEBI	Bacterial wilt (Erwinia)	1.0-2.0 lb/A (50% WP)	Foliar application. Apply as above to aid in the control of bacterial wilt.
/28073AA	Carrots		Exempt No preharvest interval through 3.25 pounds per acre.
FBATQBB	Leaf blights	1.5-3.25 lb/A (50%, 53%, 55% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply before disease appears. Repeat at 7 to 10 day intervals. --OR MAI--
FMBCQBB	Leaf spots		
		[MAI] 1.5-2.1 lb/A (6% D)	Formulated with sulfur.

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Cauliflower		See Broccoli cluster.
/28003AA	Celery		Exempt No preharvest interval through 3.25 pounds per acre.
FBAAPDZ	Bacterial blight (Pseudomonas)	1.0-3.25 lb/A (33.3%, 50%, 53%, 55% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply when plants are set in field or disease is first reported in area. Repeat at 7 to 10 day intervals. --OR MAI--
FBAMCBM	Early blight (Cercospora)		
FBASSBL	Late blight (Septoria)		
		[MAI] 1.2 lb/A [dust] or 1.2 lb/100 gal/A (6% WP/D) or 1.5-2.1 lb/A (6% D)	Formulated with rotenone; or sulfur.
		2.52 lb/100 gal (53% WP)	Plant bed and foliar applications. Apply in plant bed when plants are 3 inches high. Repeat 1 week before transplanting, 1 week after transplanting, and at 2 week intervals up to within 2 weeks of harvest.
/05002AA	Cherry		Exempt See dosage limits below.
FBADMCB	Brown rot blossom blight (Monilinia)	2.0-3.0 lb/100 gal [max. 12.5 lb/A] (50%, 53% WP) or 2.4-3.0 lb/A (6% D)	Delayed dormant and foliar applications. Apply at popcorn, full bloom, and petal fall stages. --OR MAI--
FMBCCDJ	Cherry leaf spot (Coccomyces)		
		[MAI] 2.4-3.0 lb/A (6% D)	Formulated with sulfur.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Cherry (continued)		
FMBCCDJ	Cherry leaf spot (Coccomyces)	0.625-0.825 lb/100 gal (50%, 55% WP)	Foliar and postharvest applications. Add 3 pounds of hydrated lime. Apply in cover sprays at 7 to 10 day intervals and make 1 to 2 postharvest foliage applications.
FBAAPDZ	Dead bud (Pseudomonas)	3.0 lb/100 gal (50% WP)	Apply in October (before heavy rain falls) and again before bud swell in the spring. Add 1 pint of superior type oil.
/02000AA	**Citrus Fruits**		Exempt See dosage limits below. Do not apply in areas where copper injury is known to occur or where fumigation with hydrogen cyanide gas is practiced. Application may be made at low rates in areas where severe copper injury is known to occur, but spray skirts no more than 2 feet high.
FGAJPCN	Brown rot gummosis (Phytophthora)	0.25-1.375 lb/100 gal (20%, 24%, 50%, 53% WP) or 3.0 lb/A (6% D)	Foliar and soil application. Add 0.5 to 1.5 pounds hydrated lime to sprays. Apply during the winter months. Spray the ground around the tree and the skirts of the trees to a height of 3 to 4 feet, covering the fruit. Treat inside as well as outside spraying trunks and skirts thoroughly using 4 to 6 gallons per tree. The number of applications depends upon the amount of rain. --OR MAI--
		[MAI] 3.0 lb/A (6% D)	Formulated with sulfur.
FMAYMCO	Greasy spot (Mycosphaerella)	1.0 lb/100 gal (50% WP)	Foliar application. Apply anytime within 2 months after expansion of early spring flushes or within 1 month after expansion in late spring and other flushes of growth.

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Citrus Fruits (continued)		
FMAYMCO	Greasy spot (Mycosphaerella)	3.0-3.35 lb/ 500 gal (15.23%, 50%, 55% WP)	Dormant and foliar applications. Apply in dormant season before spring growth appears. Repeat 1 to 3 weeks after petal fall. For melanose and scab, repeat 4 weeks later. Do not apply after fruit is 0.75 inch in diameter.
FIBLDAP	Melanose (Diaporthe)		
FAABEAH	Scab (spot anthracnose) (Elsinoe)		
	Cucumber		See Cantaloupe cluster.
	Cucurbits		See Cantaloupe cluster.
/11001AA	Eggplant		Exempt No preharvest interval through 2.12 pounds per acre.
FAAACDP	Anthracnose (Colletotrichum)	1.0-2.12 lb/A (50%, 53% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply before disease is expected to appear. Repeat at 7 to 10 day intervals. --OR MAI--
FBASPCN	Late blight (Phytophthora)		
FMBCQBB	Leaf spots		
FBAAPBU	Phomopsis blight		
		[MAI] 1.5-2.1 lb/A (6% D)	Formulated with sulfur.
/03005AA	Filbert		Exempt Apply through 3.0 pounds per acre.
FBAAXAA	Bacterial blight (Xanthomonas)	3.0 lb/A (6% D)	Foliar and postharvest applications. Apply twice, once in August and the second when half of the leaves have dropped. If the fall is unusually wet, make a third application when most of the leaves have dropped. --OR MAI--
		[MAI] 3.0 lb/A (6% D)	Formulated with sulfur.

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/01014AA	Grapes		Exempt No preharvest interval through 1.66 pounds per acre as a spray or 3.0 pounds per acre as a dust.
FIBFGBG FFABPCV FFACUAB	Black rot (Guignardia) Downy mildew (Plasmopara) Powdery mildew (Uncinula)	1.0-1.25 lb/100 gal (50%, 55% WP) or 1.56-1.66 lb/125 gal/A (50%, 53% WP)	Delayed dormant and foliar applications. For black rot, apply when buds break. Repeat when new shoots are 10 inches long, when blossoms fall, and when berries reach the size of BB shots. For downy mildew and powdery mildew, apply when disease is first reported in the area. Repeat at 7 to 10 day intervals or as needed for control. --OR MAI--
		[MAI] 1.2-3.0 lb/A (6%, 15% D)	Formulated with sulfur; or endosulfan.
/08020AA	Hops		Exempt Apply through 2.12 pounds per acre as a crown treatment.
FFABPEA	Downy mildew (Pseudoperonospora)	1.5-2.12 lb/A (50%, 53% WP) 1.5-2.1 lb/A or (6% D)	Crown treatment. Apply in early spring as a crown treatment. --OR MAI--
		[MAI] 1.5-2.1 lb/A (6% D)	Formulated with sulfur.
/13020AA	Lettuce		Exempt No preharvest interval through 2.12 pounds per acre.
FFABBBA	Downy mildew (Bremia)	0.5-2.12 lb/A (50%, 53% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply before disease is expected to appear. Repeat at 7 to 10 day intervals as needed. --OR MAI--
		[MAI] 1.5-2.1 lb/A (6% D)	Formulated with sulfur.
	Loganberry		See Blackberry cluster.

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Melons		See Cantaloupe cluster.
/05003AA /05004AA	Nectarine Peach		Exempt See dosage limits below.
FMZAXAA	Bacterial spot (Xanthomonas)	2.0 lb/100 gal (50% WP)	Dormant and delayed dormant applications. Add 2 gallons of dormant flowable oil emulsion. Apply as a fall spray and in the spring at bud swell.
FBADMCB	Brown rot blossom blight (Monilinia)	1.5-2.5 lb/ 100 gal (50%, 53% WP) or 2.4-3.0 lb/A (6% D)	Delayed dormant and foliar applications. Apply in prebloom, bloom, and petal fall. --OR MAI--
		[MAI] 2.4-3.0 lb/A (6% D)	Formulated with sulfur.
		2.0-2.5 lb/ 100 gal/A (50% WP)	Delayed dormant and foliar applications. Registration Number 005967-00037: Apply in prebloom, petal fall, and postbloom as needed. Do not apply after petal fall to young tender foliage of peach.
FEAGTAB FBAZCEL	Leaf curl (Taphrina) Shothole (Coryneum blight)	1.44-2.0 lb/ 100 gal (20%, 24%, 50% WP)	Dormant and delayed dormant applications. Add the recommended amount of dormant flowable oil emulsion. Apply as a dormant spray and at bud swell.
		2.0-2.385 lb/ 100 gal [peach max.: 9.54 lb/A] [nectarine max.: 13.25 lb/A] (50%, 53% WP)	Dormant and delayed dormant applications. Apply as a fall dormant spray or just before bud swell or at pink bud.
		2.0 lb/100 gal (50% WP) or 2.4-3.0 lb/A (6% D)	Dormant, delayed dormant and foliar applications. Apply in fall dormant period. Repeat in spring at bud swell and again at petal fall. --OR MAI--

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Nectarine cluster (continued)		
		[MAI] 2.4-3.0 lb/A (6% D)	Formulated with sulfur.
		5.76 lb/60-90 gal/A (24% WP)	Delayed dormant and foliar applications. Apply using ground concentrate equipment. Apply from prebloom to petal fall.
		6.0-8.48 lb/A (50%, 53% WP)	Use limited to CA. Dormant application. Apply in dormant up to bud swell.
/14011AA	Onion		Exempt See dosage limits below.
FFABPAU	Downy mildew (Peronospora)	ground: 1.5-2.12 lb/50-100 gal/A or aircraft: 3.5-3.71 lb/5 gal/A (50%, 53% WP)	Use limited to CA. Foliar application. Apply when disease first appears and repeat at 7 to 10 day intervals throughout the season.
		1.5-2.0 lb/A (50% WP)	Foliar application. Apply as needed and repeat at 7 to 10 day intervals throughout the season.
	Peach		See Nectarine cluster.
/04003AA	Pear		Exempt Apply through 2.98 pounds per acre. Do not apply after petal fall. Do not apply to d'Anjou, Commice, or Seckel varieties.
FBANEBI FEAJVAG	Fire blight (Erwinia) Scab (Venturia)	0.125-0.13 lb/100 gal [max. 2.98 lb/A] (50%, 53% WP) or 0.6-1.2 lb/A (3% D)	Foliar application. Apply at 10 percent bloom. Repeat at 3 to 5 day intervals until late bloom is over. --OR MAI--

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Pear (continued)		
		[MAI] 0.9-1.8 lb/A (3%, 6% D)	Formulated with sulfur.
FBANEBI	Fire blight (Erwinia)	1.0-2.0 lb/ 100 gal (50% WP)	Dormant application. Apply as a full cover spray between dormant and bud swell.
		1.0-1.59 lb/A (50%, 53% WP)	Use limited to CA. Foliar application. Apply during bloom and periods favorable to disease development.
/28017AA	**Peppers**		Exempt No preharvest interval through 2.12 pounds per acre.
FAAACDP	Anthracnose (Colletotrichum)	1.0-2.12 lb/A (33.3%, 50%, 53% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply before diseases appear. Repeat at 7 to 14 day intervals. --OR MAI--
FMAAXAA	Bacterial spot (Xanthomonas)		
FMBCCBM	Leaf spot (Cercospora)		
FBASPCN	Late blight (Phytophthora)		
		[MAI] 1.5-2.1 lb/A (6% D)	Formulated with sulfur; or endosulfan.
FKAAQBB	Damping-off	2.0-2.125 lb/ 100 gal (50% WP)	Foliar application. Apply at time of emergence until plants reach a height of 4 to 6 inches. Repeat at 4 to 7 day intervals. Apply to plants and surrounding soil.
/05005AA /05006AA	**Plum** **Prune**		Exempt See dosage limits below. Do not apply after petal fall.
FBADMCB	Brown rot blossom blight (Monilinia)	1.25-2.0 lb/ 100 gal [max. 3.0 lb/A] (50% WP) or 0.31-0.46 lb/ 100 gal (50%, 53% WP)	Delayed dormant and foliar applications. Apply at popcorn and full bloom. --OR MAI--

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Plum cluster (continued)		
		[MAI] 2.4-3.0 lb/A (6% D)	Formulated with sulfur.
		3.0-3.18 lb/A (50%, 53% WP)	Use limited to CA. Delayed dormant and foliar applications. Apply in prebloom, bloom, and petal fall.
/14013AA	Potato		Exempt No preharvest interval through 2.2 pounds per acre.
FBAMAAX FBASPCN	Early blight (Alternaria) Late blight (Phytophthora)	0.75-2.2 lb/A (33.3%, 50%, 53%, 55% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply when plants are 4 to 6 inches high or when disease first appears in area. Repeat at 4 to 10 day intervals. —OR MAI--
		[MAI] 1.2-3.0 lb/A (6% D) (6% WP/D) or 1.2-3.0 lb/100 gal/A (6% WP/D)	Formulated with rotenone; sulfur; or endosulfan.
	Prune		See Plum cluster.
	Pumpkins		See Cantaloupe cluster.
	Raspberry		See Blackberry cluster.
/13024AA	Spinach		Exempt No preharvest interval through 2.915 pounds per acre.
FFABPAU	Downy mildew (blue mold) (Peronospora)	2.25-2.915 lb/100 gal/A (50%, 53% WP)	Foliar application. Apply uniformly when conditions favor disease.
	Squash		See Cantaloupe cluster.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/01016AA	**Strawberry**		Exempt No preharvest interval through 1.325 pounds per 100 gallons.
FMBCMCO	Leaf spot (Mycosphaerella)	1.25-1.325 lb/100 gal (50%, 53% WP)	Delayed dormant and foliar applications. Apply thoroughly at 7 to 10 day intervals during growing season.
FFACSCO	Powdery mildew (Sphaerotheca)		
/28020AA	**Sugar Beets**		Exempt No preharvest interval through 3.3 pounds per acre.
FMBCCBM	Leaf spot (Cercospora)	1.0-3.3 lb/A (50%, 53%, 55% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply when disease appears. Repeat as needed. --OR MAI--
		[MAI] 1.5-2.1 lb/A (6% D)	Formulated with sulfur.
/11005AA	**Tomato**		Exempt No preharvest interval through 3.85 pounds per acre.
FAAAGAP	Anthracnose (Glomerella)	1.0-3.85 lb/A (33.3%, 50%, 53%, 55% WP) or 1.5-2.1 lb/A (6% D)	Foliar application. Apply when plants are 5 to 6 inches high and again when fruit is set; or apply when disease first appears. Repeat at 4 to 10 day intervals. In areas where blight is severe, begin when plants are set in field. --OR MAI--
FBAMAAX	Early blight (Alternaria)		
FBASPCN	Late blight (Phytophthora)		
FMBCSBL	Leaf spot (Septoria)		
		[MAI] 1.2-3.0 lb/A (6% D) (6% WP/D) or 1.2-3.0 lb/ 100 gal/A (6% WP/D)	Formulated with rotenone; sulfur; or endosulfan.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	Tomato (continued)		
FMAAXAA	Bacterial spot (Xanthomonas)	1.0-3.3 lb/A (50%, 53%, 55% WP)	Plant bed and foliar application. Apply beginning in plant bed after first leaves appear. Repeat at 5 to 7 day intervals if disease is known to occur in the area.
/28024AA /28024CA	**Vegetables** (seedlings in cold-frames, greenhouses, hot beds, etc.)		Exempt See dosage limits below. Do not apply to cabbage and related seedlings.
FKAAQBB	Damping-off	2.0 lb/A (50% WP) or 2.0-2.25 lb/100 gal or 1.0-1.1 oz/3 gal (50%, 53%, 55% WP)	Foliar and soil application to seedlings. Apply when plants emerge. Repeat at 4 to 7 day intervals. Spray plants and surrounding soil.
/03009AA	**Walnut**		Exempt No preharvest interval through 23.85 pounds per acre.
FBZAXAA	Walnut blight (Xanthomonas)	1.5-2.5 lb/100 gal (50% WP) or 1.2-3.0 lb/A (6% D)	Delayed dormant and foliar applications. Apply in prebloom stages. Repeat at 1 percent and 10 to 20 percent pistillate bloom and postbloom as needed. If rains are forecast during bloom, apply immediately.
		1.19-2.52 lb/100 gal [max. 23.85 lb/A] (50%, 53% WP)	Foliar application. Apply at 1 percent pistillate bloom and again at 10 percent pistillate bloom.
		6.0-8.48 lb/A (50%, 53% WP)	Use limited to CA. Delayed dormant and foliar applications. Apply in prebloom, bloom, and postbloom.
	Watermelons		See Cantaloupe cluster.

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	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	TERRESTRIAL NON-FOOD CROP		
	(Agricultural Crops)		
/26003AA	Tobacco		
FGASPDZ	Wildfire (Pseudomonas)	1.25-1.325 lb/100 gal (50%, 53% WP)	Plant bed application. Apply when plants are in two-leaf stage. Repeat at weekly intervals. Apply to foliage and soil.
	(Ornamental Plants and Forest Trees)		
/34022AA	Azalea		
FBAIBBC	Bud and twig blight (Briosia)	2.0-2.2 lb/ 100 gal (50%, 53%, 55% WP)	Foliar application. Apply when disease is first reported in area. Repeat at 7 to 10 day intervals or as needed for control.
/31084AA /31143AA /31151AA	Dahlias		
FBAABAW	Botrytis blight	1.25-1.325 lb/100 gal (50%, 53% WP)	Foliar application. Apply before disease appears. Repeat at 7 to 10 day intervals and after rains.
FMBCQBB	Leaf spots		
/35083AA /35230AA	Maple		
FMBTRAW	Tar spot (Rhytisma)	2.0-2.2 lb/ 100 gal (50%, 53%, 55% WP)	Foliar application. Add 2 pounds of hydrated lime. Apply when disease is first reported in area. Repeat at 7 to 10 day intervals as needed.
/31143AA	Nasturtium		
FMBCQBB	Leaf spots		
		Refer to Dahlias for dose and use information.	
/34106AA	Pachysandra		
FBBJVAL	Volutella leaf and stem blight	1.65-1.855 lb/100 gal (50%, 53%, 55% WP)	Foliar application. Add 3 pounds of hydrated lime. Apply when disease is first reported in area. Repeat at 7 to 10 day intervals or as needed for control.

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
/31151AA	Peonies		
FAAAGAN	Anthracnose (Gloeosporium)		
FBAABAW	Botrytis blight		
		Refer to Dahlias for dose and use information.	
/34109AA	Periwinkle		
FDABPBU	Canker (dieback) (Phomopsis)	2.0-2.2 lb/ 100 gal (50%, 53%, 55% WP)	Foliar application. Apply when disease is reported in area. Repeat at 7 to 10 day intervals or as needed for control.
/34120AA	Rose		
FMAEDBS	Black spot (Diplocarpon)	1.25-1.325 lb/100 gal (50%, 53% WP)	Foliar application. Apply before disease appears. For black spot, apply when leaf buds swell in early spring. Repeat at 7 to 10 day intervals and after rains.
FMBCQBB	Leaf spots		
FJAAPBW	Rust (Phragmidium)		
/35230AA	White Oak		
FAAAGAT	Anthracnose (Gnomonia)		
		Refer to Maple for dosage and use information.	
	GREENHOUSE FOOD CROP		
	(Agricultural Crops)		
/28024CA	Vegetables (seedlings)		
		Refer to TERRESTRIAL FOOD CROP, (Agricultural Crops), Vegetables (seedlings in coldframes, greenhouses, hot beds, etc.) for pest, use and limitation information.	

COPPER OXYCHLORIDE SULFATE

	Site and Pest	Dosages and Formulation(s)	Tolerance, Use, Limitations
	AERIAL AND TANK MIX APPLICATIONS		
9001500 AAAAAAA	**Aerial Application**		
	--	Refer to TERRESTRIAL FOOD CROP (Agricultural Crops)	All sites except Hops and Vegetables (seedlings in coldframes, greenhouses, hot beds etc.)

COPPER OXYCHLORIDE SULFATE

Listing of Registered Pesticide Products by Formulation

6056.0001 56% (metallic copper equivalent) technical chemical
copper oxychloride sulfate (023503)
035896-00001

6057.0001 57% (metallic copper equivalent) technical chemical
copper oxychloride sulfate (023503)
000962-00388

6003.0003 3% (metallic copper equivalent) dust
copper oxychloride sulfate (023503)
000279-00934

copper oxychloride sulfate (023503) plus sulfur or sulphur (077501)
000279-00935

6006.0003 6% (metallic copper equivalent) dust
copper oxychloride sulfate (023503)
000279-00080

copper oxychloride sulfate (023503) plus sulfur or sulphur (077501)
000279-00458

copper oxychloride sulfate (023503) plus endosulfan (079401)
000279-01322 000279-01589

6015.0003 15% (metallic copper equivalent) dust
copper oxychloride sulfate (023503) plus sulfur or sulphur (077501)
000279-02297

6015.2306 15.23% (metallic copper equivalent) wettable powder
copper oxychloride sulfate (023503)
000279-02402

6020.0006 20% (metallic copper equivalent) wettable powder
copper oxychloride sulfate (023503)
000279-02200

6204.0006 24% (metallic copper equivalent) wettable powder
copper oxychloride sulfate (023503)
000279-02445

6033.3006 33.3% (metallic copper equivalent) wettable powder
copper oxychloride sulfate (023503)
000279-00485

6050.0006 50% (metallic copper equivalent) wettable powder
copper oxychloride sulfate (023503)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254 035986-00013

Listing of Registered Pesticide Products by Formulation (continued)

6053.0006 53% (metallic copper equivalent) wettable powder
copper oxychloride sulfate (023503)
000962-00291 001439-00160

6055.0006 55% (metallic copper equivalent) wettable powder
copper oxychloride sulfate (023503)
000279-00069

6006.0007 6% (metallic copper equivalent) wettable powder/dust
copper oxychloride sulfate (023503) plus rotenone (and other cube resins) (073001)
000607-00039

9999999 State Label Registration

CA Reg. No.
000239-10296 000239-10409 005719-04903

COPPER OXYCHLORIDE SULFATE

Appendix A

Listing of Multiple Active Ingredient Chemical Names Used in the Entry

Chemical Code	Common Name (source)	EPA Acceptable Common/Chemical Name
079401	--	endosulfan
073001	rotenone	rotenone (and other cube resins)
077501	sulfur	sulfur or sulphur

-- Use EPA Acceptable Common/Chemical Name

COPPER OXYCHLORIDE SULFATE

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number

TERRESTRIAL FOOD CROP

(Agricultural Crops)

/03001AA	Almond
FBADMCB	Brown rot blossom blight (Monilinia)
FBAZCEL	Shothole (Coryneum blight)
	(6% D)
	000279-00080 000279-00458
	(50% WP)
	000279-00614 000962-00342 005967-00037 007001-00254 035986-00013
	(53% WP)
	000962-00291
/04001AA	Apple
FCAAPCE	Blotch (Phyllosticta)
FMAIMCO	Brook's fruit spot (Mycosphaerella)
FBANEBI	Fire blight (Erwinia)
FEAJVAG	Scab (Venturia)
	(3% D)
	000279-00934 000279-00935
	(6% D)
	000279-00080 000279-00458
	(50% WP)
	000279-00614 000962-00342 007001-00254 035986-00013
	(53% WP)
	000962-00291
/05001AA	Apricot
FBADMCB	Brown rot blossom blight (Monilinia)
FEAGTAB	Leaf curl (Taphrina)
FBAZCEL	Shothole (Coryneum blight)
	(6% D)
	000279-00080
	(20% WP)
	000279-02200
	(24% WP)
	000279-02445
	(50% WP)
	000279-00614 000962-00342 007001-00254 035986-00013

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Apricot (continued)

(53% WP)
000962-00291 001439-00160

/28001AA Beans
FFABPCN Downy mildew (Phytophthora)
FMBJQBB Pod spot
(6% D)
000279-00080

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254 035986-00013

(53% WP)
000962-00291

/28002AA Beets
FBAAQBB Blight
FMBCQBB Leaf spot
(50% WP)
000962-00342 005967-00037 007001-00254

(53% WP)
000962-00291

/01002AA Blackberry
FAAAEAH Anthracnose (Elsinoe)
FJACKAH Cane rust (yellow rust) (Kuehneola)
FMALSBL Cane spot (Septoria)
FMBCSBL Leaf spot (Septoria)
(6% D)
000279-00080

(50% WP)
000279-00614 000962-00342 007001-00254 035986-00013

(53% WP)
000962-00291

/01003AA Boysenberry
FAAAEAH Anthracnose (Elsinoe)
FJACKAH Cane rust (yellow rust) (Kuehneola)
FMALSBL Cane spot (Septoria)
FMBCSBL Leaf spot (Septoria)
(6% D)
000279-00080

Boysenberry (continued)

(50% WP)
000279-00614 000962-00342 007001-00254

(53% WP)
000962-00291

/13005AA **Broccoli**
FFABPAU Downy mildew (Peronospora)
(50% WP)
000962-00342

(53% WP)
000962-00291

/13006AA **Brussels Sprouts**
FFABPAU Downy mildew (Peronospora)
(50% WP)
000962-00342

(53% WP)
000962-00291

/13007AA **Cabbage**
FFABPAU Downy mildew (Peronospora)
(50% WP)
000962-00342

(53% WP)
000962-00291

/10002AA **Cantaloupe**
FMABPDZ Angular leaf spot (Pseudomonas)
FAAACDP Anthracnose (Colletotrichum)
FGZTEBI Bacterial wilt (Erwinia)
FFABPEA Downy mildew (Pseudoperonospora)
FBAQMCO Gummy stem blight (Mycosphaerella)
FBATAAX Leaf blight (Alternaria)
FMBCCBM Leaf spot (Cercospora)
FFACEBJ Powdery mildew (Erysiphe)
FEAJCCV Scab (Cladosporium)
(50% WP)
007001-00254

/28073AA	Carrots
FBATQBB	Leaf blights
FMBCQBB	Leaf spots
	(6% D)
	000279-00080 000279-00458
	(50% WP)
	000279-01077 000962-00342 005967-00037 007001-00254
	035986-00013
	(53% WP)
	000962-00291
	(55% WP)
	000279-00069
/13008AA	Cauliflower
FFABPAU	Downy mildew (Peronospora)
	(50% WP)
	000962-00342 035986-00013
	(53% WP)
	000962-00291
/28003AA	Celery
FBAAPDZ	Bacterial blight (Pseudomonas)
FBAMCBM	Early blight (Cercospora)
FBASSBL	Late blight (Septoria)
	(6% D)
	000279-00080 000279-00458
	(33.3% WP)
	000279-00485
	(50% WP)
	000279-00614 000279-01077 000962-00342 005967-00037
	007001-00254 035986-00013
	(53% WP)
	000962-00291 001439-00160
	(55% WP)
	000279-00069
	(6% WP/D)
	000607-00039

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/05002AA	Cherry
FBADMCB	Brown rot blossom blight (Monilinia)
FMBCCDJ	Cherry leaf spot (Coccomyces)
FBAAPDZ	Dead bud (Pseudomonas)
	(6% D)
	000279-00080 000279-00458
	(50% WP)
	000279-00614 000962-00342 007001-00254 035986-00013
	(53% WP)
	000962-00291
	(55% WP)
	000279-00069
/02000AA	Citrus Fruits
FGAJPCN	Brown rot gummosis (Phytophthora)
FMAYMCO	Greasy spot (Mycosphaerella)
FIBLDAP	Melanose (Diaporthe)
FAABEAH	Scab (spot anthracnose) (Elsinoe)
	(6% D)
	000279-00080 000279-00458
	(15.23% WP)
	000279-02402
	(20% WP)
	000279-02200
	(24% WP)
	000279-02445
	(50% WP)
	000279-01077 000962-00342 007001-00254 035986-00013
	(53% WP)
	000962-00291 001439-00160
/10010AA	Cucumber
FMABPDZ	Angular leaf spot (Pseudomonas)
FAAACDP	Anthracnose (Colletotrichum)
FGZTEBI	Bacterial wilt (Erwinia)
FFABPEA	Downy mildew (Pseudoperonospora)
FBAQMCO	Gummy stem blight (Mycosphaerella)
FBATAAX	Leaf blight (Alternaria)
FMBCCBM	Leaf spot (Cercospora)
FFACEBJ	Powdery mildew (Erysiphe)
FEAJCCV	Scab (Cladosporium)

Cucumber (continued)

(6% D)
000279-00080 000279-01589

(33.3% WP)
000279-00485

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254 035986-00013

(53% WP)
000962-00291 001439-00160

(55% WP)
000279-00069

(6% WP/D)
000607-00039

/10000AA	Cucurbits
FMABPDZ	Angular leaf spot (Pseudomonas)
FAAACDP	Anthracnose (Colletotrichum)
FGZTEBI	Bacterial wilt (Erwinia)
FFABPEA	Downy mildew (Pseudoperonospora)
FBAQMCO	Gummy stem blight (Mycosphaerella)
FBATAAX	Leaf blight (Alternaria)
FMBCCBM	Leaf spot (Cercospora)
FFACEBJ	Powdery mildew (Erysiphe)
FEAJCCV	Scab (Cladosporium)

(50% WP)
007001-00254

/11001AA	Eggplant
FAAACDP	Anthracnose (Colletotrichum)
FBASPCN	Late blight (Phytophthora)
FMBCQBB	Leaf spots
FBAAPBU	Phomopsis blight

(6% D)
000279-00080 000279-00458

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
0C 001-00254 035986-00013

(53% WP)
000962-00291

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/03005AA **Filbert**
FBAAXAA Bacterial blight (Xanthomonas)
(6% D)
000279-00080 000279-00458

/01014AA **Grapes**
FIBFGBG Black rot (Guignardia)
FFABPCV Downy mildew (Plasmopara)
FFACUAB Powdery mildew (Uncinula)
(6% D)
000279-00458 000279-01589

(15% D)
000279-02297

(50% WP)
000279-00614 000962-00342 007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

/08020AA **Hops**
FFABPEA Downy mildew (Pseudoperonospora)
(6% D)
000279-00080 000279-00458

(50% WP)
000279-00614 000279-01077 000962-00342 007001-00254
035986-00013

(53% WP)
000962-00291

/13020AA **Lettuce**
FFABBBA Downy mildew (Bremia)
(6% D)
000279-00080 000279-00458

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254

(53% WP)
000962-00291

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/01005AA	Loganberry
FAAAEAH	Anthracnose (Elsinoe)
FJACKAH	Cane rust (yellow rust) (Kuehneola)
FMALSBL	Cane spot (Septoria)
FMBCSBL	Leaf spot (Septoria)
	(6% D)
	000279-00080
	(50% WP)
	000279-00614 000962-00342 007001-00254
	(53% WP)
	000962-00291
/10001AA	Melons
FMABPDZ	Angular leaf spot (Pseudomonas)
FAAACDP	Anthracnose (Colletotrichum)
FGZTEBI	Bacterial wilt (Erwinia)
FFABPEA	Downy mildew (Pseudoperonospora)
FBAQMCO	Gummy stem blight (Mycosphaerella)
FBATAAX	Leaf blight (Alternaria)
FMBCCBM	Leaf spot (Cercospora)
FFACEBJ	Powdery mildew (Erysiphe)
FEAJCCV	Scab (Cladosporium)
	(6% D)
	000279-00080 000279-01589
	(33.3% WP)
	000279-00485
	(50% WP)
	000279-00614 000279-01077 000962-00342 005967-00037 007001-00254
	(53% WP)
	000962-00291 001439-00160
	(6% WP/D)
	000607-00039
/05003AA	Nectarine
FMZAXAA	Bacterial spot (Xanthomonas)
FBADMCB	Brown rot blossom blight (Monilinia)
FEAGTAB	Leaf curl (Taphrina)
FBAZCEL	Shothole (Coryneum blight)
	(6% D)
	000279-00080 000279-00458

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Nectarine (continued)

(20% WP)
000279-02200

(24% WP)
000279-02445

(50% WP)
000962-00342 005967-00037 007001-00254 035986-00013

(53% WP)
000962-00291 001439-00160

/14011AA Onion
FFABPAU Downy mildew (Peronospora)
(50% WP)
000279-01077 000962-00342

(53% WP)
000962-00291

/05004AA Peach
FMZAXAA Bacterial spot (Xanthomonas)
FBADMCB Brown rot blossom blight (Monilinia)
FEAGTAB Leaf curl (Taphrina)
FBAZCEL Shothole (Coryneum blight)
(6% D)
000279-00080 000279-00458

(20% WP)
000279-02200

(24% WP)
000279-02445

(50% WP)
000962-00342 005967-00037 007001-00254 035986-00013

(53% WP)
000962-00291 001439-00160

/04003AA Pear
FBANEBI Fire blight (Erwinia)
FEAJVAG Scab (Venturia)
(3% D)
000279-00934 000279-00935

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Pear (continued)

(6% D)
000279-00458

(50% WP)
000279-00614 000962-00342 005967-00037 007001-00254
035986-00013

(53% WP)
000962-00291

/28017AA Peppers
FAAACDP Anthracnose (Colletotrichum)
FMAAXAA Bacterial spot (Xanthomonas)
FKAAQBB Damping-off
FBASPCN Late blight (Phytophthora)
FMBCCBM Leaf spot (Cercospora)
(6% D)
000279-00080 000279-00458 000279-01589

(33.3% WP)
000279-00485

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254 035986-00013

(53% WP)
000962-00291

/05005AA Plum
FBADMCB Brown rot blossom blight (Monilinia)
(6% D)
000279-00458

(50% WP)
000962-00342 005967-00037 007001-00254 035986-00013

(53% WP)
000962-00291

/14013AA Potato
FBAMAAX Early blight (Alternaria)
FBASPCN Late blight (Phytophthora)
(6% D)
000279-00080 000279-00458 000279-01322 000279-01589

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

	Potato (continued)
	(33.3% WP)
	000279-00485
	(50% WP)
	000279-00614 000279-01077 000962-00342 005967-00037
	007001-00254 035986-00013
	(53% WP)
	000962-00291
	(55% WP)
	000279-00069
	(6% WP/D)
	000607-00039
/05006AA	**Prune**
FBADMCB	Brown rot blossom blight (Monilinia)
	(6% D)
	000279-00458
	(50% WP)
	000962-00342 007001-00254
	(53% WP)
	000962-00291
/10011AA	**Pumpkins**
FMABPDZ	Angular leaf spot (Pseudomonas)
FAAACDP	Anthracnose (Colletotrichum)
FGZTEBI	Bacterial wilt (Erwinia)
FFABPEA	Downy mildew (Pseudoperonospora)
FBAQMCO	Gummy stem blight (Mycosphaerella)
FBATAAX	Leaf blight (Alternaria)
FMBCCBM	Leaf spot (Cercospora)
FFACEBJ	Powdery mildew (Erysiphe)
FEAJCCV	Scab (Cladosporium)
	(6% D)
	000279-01589
	(50% WP)
	007001-00254

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/01006AA **Raspberry**
FAAAEAH Anthracnose (Elsinoe)
FJACKAH Cane rust (yellow rust) (Kuehneola)
FMALSBL Cane spot (Septoria)
FMBCSBL Leaf spot (Septoria)

(6% D)
000279-00080

(50% WP)
000279-00614 000962-00342 007001-00254 035986-00013

(53% WP)
000962-00291

/13024AA **Spinach**
FFABPAU Downy mildew (blue mold) (Peronospora)

(50% WP)
000962-00342

(53% WP)
000962-00291

/10012AA **Squash**
FMABPDZ Angular leaf spot (Pseudomonas)
FAAACDP Anthracnose (Colletotrichum)
FGZTEBI Bacterial wilt (Erwinia)
FFABPEA Downy mildew (Pseudoperonospora)
FBAQMCO Gummy stem blight (Mycosphaerella)
FBATAAX Leaf blight (Alternaria)
FMBCCBM Leaf spot (Cercospora)
FFACEBJ Powdery mildew (Erysiphe)
FEAJCCV Scab (Cladosporium)

(6% D)
000279-00080 000279-01589

(33.3% WP)
000279-00485

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254 035986-00013

(53% WP)
000962-00291 001439-00160

(55% WP)
000279-00069

Squash (continued)

(6% WP/D)
000607-00039

/01016AA Strawberry
FMBCMCO Leaf spot (Mycosphaerella)
FFACSCO Powdery mildew (Sphaerotheca)
(50% WP)
000962-00342 007001-00254

(53% WP)
000962-00291

/28020AA Sugar Beets
FMBCCBM Leaf spot (Cercospora)
(6% D)
000279-00080 000279-00458

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254 035986-00013

(53% WP)
000962-00291

(55% WP)
000279-00069

/11005AA Tomato
FAAAGAP Anthracnose (Glomerella)
FMAAXAA Bacterial spot (Xanthomonas)
FBAMAAX Early blight (Alternaria)
FBASPCN Late blight (Phytophthora)
FMBCSBL Leaf spot (Septoria)
(6% D)
000279-00080 000279-00458 000279-01322 000279-01589

(33.3% WP)
000279-00485

(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254 035986-00013

(53% WP)
000962-00291

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Tomato (continued)

(55% WP)
000279-00069

(6% WP/D)
000607-00039

/28024AA Vegetables (seedlings in coldframes, greenhouses, hot beds, etc.)
FKAAQBB Damping-off
(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

/03009AA Walnut
FBZAXAA Walnut blight (Xanthomonas)
(6% D)
000279-00080

(50% WP)
000279-00614 000962-00342 005967-00037 007001-00254
035986-00013

(53% WP)
000962-00291

/10008AA Watermelons
FMABPDZ Angular leaf spot (Pseudomonas)
FAAACDP Anthracnose (Colletotrichum)
FGZTEBI Bacterial wilt (Erwinia)
FFABPEA Downy mildew (Pseudoperonospora)
FBAQMCO Gummy stem blight (Mycosphaerella)
FBATAAX Leaf blight (Alternaria)
FMBCCBM Leaf spot (Cercospora)
FFACEBJ Powdery mildew (Erysiphe)
FEAJCCV Scab (Cladosporium)
(50% WP)
007001-00254

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

TERRESTRIAL NON-FOOD CROP

(Agricultural Crops)

/26003AA **Tobacco**
FGASPDZ Wildfire (Pseudomonas)
(50% WP)
000962-00342 007001-00254

(53% WP)
000962-00291

(Ornamental Plants and Forest Trees)

/34022AA **Azalea**
FBAIBBC Bud and twig blight (Briosia)
(50% WP)
000279-00614 000962-00342 007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

/31084AA **Dahlias**
FBAABAW Botrytis blight
FMBCQBB Leaf spots
(50% WP)
000962-00342 007001-00254

(53% WP)
000962-00291

/35083AA **Maple**
FMBTRAW Tar spot (Rhytisma)
(50% WP)
000279-00614 000962-00342 007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

/31143AA **Nasturtium**
FMBCQBB Leaf spots
(50% WP)
000962-00342 007001-00254

COPPER OXYCHLORIDE SULFATE

Appendix B

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

Nasturtium (continued)

(53% WP)
000962-00291

/34106AA Pachysandra
FBBJVAL Volutella leaf and stem blight
(50% WP)
000279-00614 000962-00342 007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

/31151AA Peonies
FAAAGAN Anthracnose (Gloeosporium)
FBAABAW Botrytis blight
(50% WP)
000962-00342 007001-00254

(53% WP)
000962-00291

/34109AA Periwinkle
FDABPBU Canker (dieback) (Phomopsis)
(50% WP)
000279-00614 000962-00342 007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

/34120AA Rose
FMAEDBS Black spot (Diplocarpon)
FMBCQBB Leaf spots
FJAAPBW Rust (Phragmidium)
(50% WP)
000962-00342 007001-00254

(53% WP)
000962-00291

Listing by Site/Pest and Site/Formulation/Registration Number (continued)

/35230AA
FAAAGAT

White Oak
Anthracnose (Gnomonia)
(50% WP)
000279-00614 000962-00342 007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

GREENHOUSE FOOD CROP

(Agricultural Crops)

/28024CA
FKAAQBB

Vegetables (seedlings)
Damping-off
(50% WP)
000279-00614 000279-01077 000962-00342 005967-00037
007001-00254

(53% WP)
000962-00291

(55% WP)
000279-00069

COPPER OXYCHLORIDE SULFATE

Auxiliary Documentation

CFR 40 Sec. 180.1001 - exemption from tolerance

Reg. No. 279-614 (50% WP):
This label was improperly coded under 023501, copper oxychloride.

Reg. No. 1439-160 (53% WP, approved 10/18/67):
Dosages are presented as equivalents to some Bordeaux mixes, and (except for celery) are not tied directly to a site. The implied dose range of 1.52-3.45 lb metallic copper equivalent/100 gallons was not entered for those sites.

Reg. No. 607-39 (6% WP/D, with rotenone):
The following sites with insecticide claims appear on the label and are not on any other copper oxychloride sulfate claims: asparagus, kale, kohlrabi, turnips, radish, parsnips, swiss chard, gooseberry, and currants.

APPENDIX IV

BIBLIOGRAPHY APPENDICES

GUIDE TO USE OF THIS BIBLIOGRAPHY

GROUP II COPPER COMPOUNDS

1. CONTENT OF BIBLIOGRAPHY. This bibliography contains citations of all studies considered relevant by EPA in arriving at the positions and conclusions stated elsewhere in the Standard. Primary sources for studies in this bibliography have been the body of data submitted to EPA and its predecessor agencies in support of past regulatory decisions. Selections from other sources including the published literature, in those instances where they have been considered, will be included.

2. UNITS OF ENTRY. The unit of entry in this bibliography is called a "study." In the case of published materials, this corresponds closely to an article. In the case of unpublished materials submitted to the Agency, the Agency has sought to identify documents at a level parallel to the published article from within the typically larger volumes in which they were submitted. The resulting "studies" generally have a distinct title (or at least a single subject), can stand alone for purposes of review, and can be described with a conventional bibliographic citation. The Agency has attempted also to unite basic documents and commentaries upon them, treating them as a single study.

3. IDENTIFICATION OF ENTRIES. The entries in this bibliography are sorted numerically by "Master Record Identifier," or MRID, number. This number is unique to the citation, and should be used at any time specific reference is required. It is not related to the six-digit "Accession Number" which has been used to identify volumes of submitted studies; see paragraph 4(d)(4) below for a further explanation. In a few cases, entries added to the bibliography late in the review may be preceded by a nine-character temporary identifier. These entries are listed after all MRID entries. This temporary identifier number is also to be used whenever specific reference is needed.

4. FORM OF ENTRY. In addition to the Master Record Identifier (MRID), each entry consists of a citation containing standard elements followed, in the case of material submitted to EPA, by a description of the earliest known submission. Bibliographic conventions used reflect the standards of the American National Standards Institute (ANSI), expanded to provide for certain special needs.

a. Author. Whenever the Agency could confidently identify one, the Agency has chosen to show a personal author. When no individual was identified, the Agency has shown an identifiable laboratory or testing facility as author. As a last resort, the Agency has shown the first submitter as author.

b. Document Date. When the date appears as four digits with no question marks, the Agency took it directly from the document. When a four-digit date is followed by a question mark, the bibliographer deduced the date from evidence in the document. When the date appears as (19??), the Agency was unable to determine or estimate the date of the document.

c. Title. In some cases, it has been necessary for Agency bibliographers to create or enhance a document title. Any such editorial insertions are contained between square brackets.

d. Trailing Parentheses. For studies submitted to the Agency in the past, the trailing parentheses include (in addition to any self-explanatory text) the following elements describing the earliest known submission:

  (1) Submission Date. The date of the earliest known submission appears immediately following the word "received."

  (2) Administrative Number. The next element, immediately following the word "under," is the registration number, experimental use permit number, petition number, or other administrative number associated with the earliest known submission.

  (3) Submitter. The third element is the submitter, following the phrase "submitted by." When authorship is defaulted to the submitter, this element is omitted.

  (4) Volume Identification (Accession Numbers). The final element in the trailing parentheses identifies the EPA accession number of the volume in which the original submission of the study appears. The six-digit accession number follows the symbol "CDL," standing for "Company Data Library." This accession number is in turn followed by an alphabetic suffix which shows the relative position of the study within the volume. For example, within accession number 123456, the first study would be 123456-A; the second, 123456-B; the 26th, 123456-Z; and the 27th, 123456-AA.

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY
Citations Considered to be Part of the Data Base Supporting Registrations Under the Group II Copper Compounds Standard

MRID CITATION

00002200 Crown Zellerbach Corporation (19??) Analytical Procedures and Equipment. Two undated methods. (Unpublished study received Aug 2, 1965 under 3222-6; CDL:010748-2-F)

00028002 Wellborn, T.L.; Jr. (1969) The toxicity of nine therapeutic and herbicidal compounds to striped bass. Progessive Fish-Culturist 31(?):27-32. (Also in unpublished submission received Aug 20, 1976 under 39445-1; submitted by American Carbonyl, Inc., Tenafly, N.J.; CDL:228232-C)

00036935 Atkins, E.L.; Greywood, E.A.; Macdonald, R.L. (1975) Toxicity of Pesticides and Other Agricultural Chemicals to Honey Bees: Laboratory Studies. By University of California, Dept. of Entomology. ?: UC, Cooperative Extension. (Leaflet 2287; published study.)

00047460 WARF Institute, Incorporated (1973) Report: WARF No. 2040242, 2040243, 2040244. (Compilation; unpublished study received Mar 30, 1973 under unknown admin. no.; submitted by Kocide Chemical Corp., Houston, Tex.; CDL:132472-A)

00053980 WARF Institute, Incorporated (1977) Report: WARF No. 7011554. (Unpublished study received Jun 2, 1977 under 1109-24; submitted by Cities Service Co., Atlanta, Ga.; CDL:230351-A)

00056781 Vedder, D.L. (1970) Fish Toxicity. (Unpublished study received Sep 16, 1970 under 8959-1; prepared by Marine Biochemists, Inc., submitted by Applied Biochemists, Inc., Mequon, Wis.; CDL: 100318-C)

00058009 CP Chemicals, Incorporated (1969?) COCS Manufacturing Data. (Unpublished study received Nov 12, 1975 under 35896-5; CDL: 226402-A)

00062068 Scheinberg, I.H.; Sternlieb, I. (1960) Copper metabolism. Pharmacological Reviews 12:355-381. (Also in unpublished submission received Aug 25, 1976 under 39752-1; submitted by Canadian Metafina Chemicals, New Westminster, British Columbia; CDL:228175-C)

00062069 Schroeder, H.A.; Nason, A.P.; Tipton, I.H.; et al. (1966) Essential trace metals in man: Copper. Journal of Chronic Diseases 19: 1007-1034. (Also in unpublished submission received Aug 25, 1976 under 37952-1; submitted by Canadian Metafina Chemicals, New Westminster, British Columbia; CDL:228175-D)

00065678 Cities Service Company (1965?) General Chemistry: Copper Sulfate Monohydrate. (Unpublished study received Jun 20, 1977 under 1109-33; CDL:230760-A)

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY

Citations Considered to be Part of the Data Base Supporting Registrations Under the Group II Copper Compounds Standard

MRID	CITATION
00067454	Piccirillo, V.J. (1977) Final Report: Subacute Dietary LC50 Study in Mallard Ducks: Project No. 811-106. (Unpublished study received Jul 11, 1977 under 1109-7; prepared by Hazleton Laboratories America, Inc., submitted by Cities Service Co., Atlanta, Ga.; CDL:230839-A)
00067455	Bodden, R. (1978) Report: WARF Institute No. 7020979. (Unpublished study received Jun 12, 1978 under 1109-7; prepared by WARF Institute, Inc., submitted by Cities Service Co., Atlanta, Ga.; CDL:230839-B)
00067456	WARF Institute, Incorporated (1977) Report: WARF Institute No. 7020979. (Unpublished study received Jul 11, 1977 under 1109-7; submitted by Cities Service Co., Atlanta, Ga.; CDL: 230839-C)
00070287	Richelsen Chemical Company (1976) Copper Sulfate Pentahydrate: Fate of Copper in the Environment. Summary of studies 231553-B, and 231553-D through 231553-F. (Unpublished study received Sep 13, 1977 under 41071-1; CDL:231553-A)
00070288	U.S. Bureau of Sport Fisheries and Wildlife (1974) A Review of the Literature on the Use of Copper Sulfate in Fisheries. N.P. (PB-235 445; pp. 20, 41, 58, 59 only; available from: National Technical Information Service, Springfield, VA; published study; CDL:231553-B)
00085289	Marshall, B.L. (1975) Final Report: Acute Bioassay on Shrimp (Palaemonetes vulgaris). (Unpublished study received Mar 6, 1975 under 1109-19; prepared by Marine Research Institute, submitted by Cities Service Co., Atlanta, Ga.; CDL:110616-A)
00086564	Schneider, C.L.; Potter, H.S. (1969) Tests of Fungicides To Control Sugarbeet Diseases. (Unpublished study received Dec 19, 1969 under 9F0841; submitted by Thompson-Hayward Chemical Co., Kansas City, Kans.; CDL:093544-D)
00088167	Crown Zellerbach Corporation (1949?) Analytical Methods. (Unpublished study received Jan 28, 1956 under PP0059; CDL:090057-B)
00099168	Vedder, D.L. (1970) Fish toxicity: Cutrine. (Unpublished study received Sep 16, 1970 under 8959-1; prepared by Marine Biochemists, Inc., submitted by Applied Biochemists, Inc., Mequon, Wis.; CDL:005661-F)

MRID	CITATION
00099255	Phelps Dodge Refining Company (1962?) Full Reports of Investigations Made with Safety of the Pesticide Chemical: Copper Sulfate as an Algicide. (Unpublished study received Nov 17, 1970 under 1F1093; CDL:090853-A)
00099256	Claypole, G. (19??) Careful Use of Chemicals Controls Lake Weeds and Algae. N.P. (Also in unpublished submission received Nov 17, 1970 under 1F1093; submitted by Phelps Dodge Refining Co., New York, N.Y.; CDL:090853-B)
00099257	Anthony, S.S. (1969) Algae handled efficiently by Augusta Water District. Water & Sewage Works ?(May):? (Also in unpublished submission received Nov 17, 1970 under 1F1093; submitted by Phelps Dodge Refining Co., New York, N.Y.; CDL:090853-C)
00099258	Anon. (1965) New ways to apply aquatic herbicides. Weeds, Trees and Turf ?(Feb/Apr):? (Also in unpublished submission received Nov 17, 1970 under 1F1093; submitted by Phelps Dodge Refining Co., New York, N.Y.; CDL:090853-D)
00099259	Bennett, D.G. (1967) Aquatic weed control becomes technical Operation. Weeds, Trees and Turf ?(May):? (Also in unpublished submission received Nov 17, 1970 under 1F1093; submitted by Phelps Dodge Refining Co., New York, N.Y.; CDL:090853-E)
00099260	Toth, S.J.; Riemer, D.N. (19??) Algae control in farm ponds: Are present dosage rates of copper sulphate always adequate. Without title?:? (Also in unpublished submission received Nov 17, 1970 under 1F1093; submitted by Phelps Dodge Refining Co., New York, N.Y.; CDL:090853-F)
00099262	Riemer, D.N.; Toth, S.J. (1970) Adsorption of copper by clay minerals, humic acid and bottom muds. Journal of American Water Works Association 62(3):195-197. (Also in unpublished submission received Nov 17, 1970 under 1F1093; submitted by Phelps Dodge Refining Co., New York, N.Y.; CDL:090853-H)
00099263	Toth, S.J.; Riemer, D.N. (1968) Precise chemical control of algae in ponds. Journal of American Water Works Association 60(3): 367-371. (Also in unpublished submission received Nov 17, 1970 under 1F1093; submitted by Phelps Dodge Refining Co., New York, N.Y.; CDL:090853-I)
00099269	Agway, Incorporated (1971) Efficacy of Various Compounds for Drying Onion Foliage and Regulating Harvest Time. (Compilation; unpublished study received Jul 20, 1972 under 2F1226; CDL: 091056-A)

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY
Citations Considered to be Part of the Data Base Supporting Registrations Under the Group II Copper Compounds Standard

MRID	CITATION
00099281	Markey, J.W. (1970) Letter sent to Lee Terbush dated Dec 14, 1970: Petition on copper sulfate in water--additional information on inerts. (Unpublished study received Nov 24, 1970 under 1F1073; submitted by Cities Service Co., Atlanta, Ga.; CDL:093383-A)
00099282	Hale, F.E. (1942) The Use of Copper Sulfate in Control of Microscopic Organisms. New York, N.Y.: Phelps Dodge Refining Corp. (Also in unpublished submission received Nov 24, 1970 under 1F1073; submitted by Cities Service Co., Atlanta, Ga.; CDL: 093383-B)
00099284	Armstrong, E.L. (19??) Undated letter sent to Joseph G. Cummings Copper sulfate pentahydrate to control algae and aquatic weeds. (U.S. Dept. of the Interior, Bureau of Reclamation; unpublished study; CDL:093383-E)
00099288	Stauffer Chemical Company (1970?) Sutan(R): Environmental Studies. Summary of studies 097089-B through 097089-G. (Unpublished study received on unknown date under 1F1042; CDL: 097089-A)
00099355	McCann, J. (1973) Copper-Count-N: Rainbow Trout: Test No. 564. (U.S. Environmental Protection Agency, Pesticides Regulation Div., Animal Biology Laboratory; unpublished study; CDL: 128375-A)
00099370	McCann, J.A. (1971) Kocide 101 Wettable Powder: Rainbow Trout (Salmo gairdneri): Test No. 411. (U.S. Agricultural Research Service, Pesticides Regulation Div., Animal Biology Laboratory; unpublished study; CDL:129665-A)
00099371	McCann, J.A. (1972) Kocide 101 WP: Bluegill (Lepomis macrochirus): Test No. 451. (U.S. Agricultural Research Service, Pesticides Regulation Div., Animal Biology Laboratory; unpublished study; CDL:129665-B)
00099374	McCann, J.A. (1971) Humco Copper Sulfate: Bluegill (Lepomis macrochirus): Test No. 366. (U.S. Agricultural Research Service, Pesticides Regulation Div., Animal Biology Laboratory; unpublished study; CDL:130336-A)
00099522	Timuss, D. (1975) Laboratory Analysis: Copper Sulfate: File No. 9206A. (Unpublished study received Apr 23, 1976 under 37952-1; prepared by Can Test Ltd., Canada, submitted by Canadian Metafina Chemicals, New Westminster, BC; CDL:228172-B)

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY
Citations Considered to be Part of the Data Base Supporting
Registrations Under the Group II Copper Compounds Standard

MRID	CITATION
00099537	Mereniuk, G.; Medzhibovskaia, Z. (1970) The contamination of soil and fruit by copper-containing peticides. Gigiena i Sanit. 35 (1):108-10. Taken from: Health Aspects of Pesticides Abstract Bulletin 3:445. (U.S. Dept. of Health, Education and Welfare generated; abstract 70-1590; published study; CDL:228173-Q)
00099551	Wilbur Ellis Co. (19??) Ingredients, Composition and Manufacturing Process of Copper Sulphate Pentahydrate. (Unpublished study received May 31, 1978 under 2k5-412; CDL:234177-A)
00099552	Wilbur Ellis Co. (1969) Effectiveness of Copper Sulfate to Control Aquatic Weeds and Algae. (Compilation; unpublished study received May 31, 1978 under 2935-412; CDL:234179-A)
00099558	LeBlanc, G.; Surprenant, D. (1978) Acute Toxicity of Copper Sulfate Granular Crystals to the Water Flea (Daphnia magna): Report No. BW-78-7-211. (Unpublished study received Aug 22, 1978 under 1109-20; prepared by EG & G, Bionomics, submitted by Cities Service Co., Atlanta, GA; CDL:234664-A)
00099559	Heitmuller, T. (1978) Toxicity of Cities Service Company's Copper Sulfate (pentahydrate) to Pink Shrimp (Penaeus duorarum): Report No. BP-78-8-109. (Unpublished study received Aug 22, 1978 under 1109-20; prepared by EG & G, Bionomics, submitted by Cities Service Co., Atlanta, GA; CDL:234664-B)
00099561	Hollister, T. (1978) Toxicity of Copper Sulfate (pentahydrate) to Embryos of Eastern Oysters (Crassostrea virginica): Report No. BP-78-8-108. (Unpublished study received Aug 22, 1978 under 1109-20; prepared by EG & G, Bionomics, submitted by Cities Service Co., Atlanta, GA; CDL:234664-D)
00106119	Piccirillo, V. (1977) Final Report: Subacute Dietary LC50 Study in Bobwhite Quail: Project No. 811-105. (Unpublished study received May 23, 1977 under 1109-7; prepared by Hazleton Laboratories America, Inc., submitted by Cities Service Co., Atlanta, GA; CDL:230244-A)
00126194	Phillips, A.; Spalding, T. (1982) Toxicity Study: Lacco Copper Oxychloride Sulfate 50% Sprayable Fungicide: NVP No. X2J016. (Unpublished study received Feb 8, 1983 under 962-342; prepared by Northview Pacific Laboratories, Inc., submitted by Los Angeles Chemical Co., South Gate, CA; CDL:249611-A)
00133277	Northview Pacific Laboratories, Inc. (1983) Acute Oral Toxicity Test/LD50: Lacco Copper Oxy Chloride Sulfate 50% Sprayable Fungicide: NVP No. X2J016-1. (Unpublished study received Nov 8, 1983 under 962-342; submitted by Los Angeles Chemical Co., South Gate, CA; CDL:251795-A)

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY
Citations Considered to be Part of the Data Base Supporting
Registrations Under the Group II Copper Compounds Standard

MRID	CITATION
00152502	Galloway, C. (1984) Rabbit Skin Irritation: Cupric Hydroxide: Project No. 3482-84. Unpublished study prepared by Stillmeadow, Inc. 10 p.
00152503	Galloway, C. (1984) Rabbit Eye Irritation: Cupric Hydroxide: Project No. 3481-84. Unpublishd study prepared by Stillmeadow, Inc. 17 p.
00152504	Sabol, E. (1985) Guinea Pig Skin Sensitization: Cupric Hydroxide: Project No. 3483-84. Unpublished study prepared by Stillmeadow, Inc. 14 p.
00152505	Galloway, C. (1984) Rabbit Acute Dermal Toxicity: Cupric Hydroxide: Project No. 3480-84. Unpublished study prepared by Stillmeadow, Inc. 9 p.
00152506	Galloway, C. (1985) Rat Acute Oral Toxicity: Cupric Hydroxide: Project No. 3479-84. Unpublished study prepared by Stillmeadow, Inc. 21 p.
00155931	Rosenfeld, G. (1984) Acute Oral Toxicity Study in Rats: Copper Oxychloride Technical: C.S.E. #S8687-4: Study #1144A. Unpublished study prepared by Cosmopolitan Safety Evaluation, Inc. 29 p.
00155932	Rosenfeld, G. (1984) Acute Inhalation Toxicity Study in Rats: Copper Oxychloride Technical: C.S.E. #S8687-4: Study #1144C. Unpublished study prepared by Cosmopolitan Safety Evaluation, Inc. 31 p.
00155934	Rosenfeld, G. (1984) Primary Eye Irritation Study in Rabbits: Copper Oxychloride Technical: C.S.E. #S8687-4: Study #1144D. Unpublished study prepared by Cosmopolitan Safety Evaluation, Inc. 23 p.
00155935	Rosenfeld, G. (1984) Primary Dermal Irritation Study in Rabbits: Copper Oxychloride Technical: C.S.E. #S8687-4: Study #1144E. Unpublished study prepared by Cosmopolitan Safety Evaluation, Inc. 13 p.
00155936	Rosenfeld, G. (1984) Guinea Pig Sensitization Study (Buehler): Copper Oxychloride Technical: C.S.E. #S8687-4 Study #1144F. Unpublished study prepared by Cosmopolitan Safety Evaluation, Inc. 15 p.
00159371	Leenihan, M. (1985) Acute Oral Toxicity (LD50); Acute Dermal Toxicity; Primary Skin Irritation; Primary Eye Irritation: NVP Report No. X5J030G. Unpublished study prepared by Northview Pacific Laboratories, Inc. 33 p.
00160580	Newton, P. (1986) Four Hour Acute Dust Aerosol Inhalation Toxicity Study in Rats of Copper Hydroxide Formulated 50% Cu: Study No. 420-2611. Unpublished study prepared by American Biogenics Corp. 47 p.

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY
Citations Considered to be Part of the Data Base Supporting
Registrations Under the Group II Copper Compounds Standard

GS0649-001 Crown Zellerbach Corp. (1956) Addendum to Petition PP0059 dated Feb 27, 1956. 12 p.

GS0649-002 Gibson, R.D. (1975) LC_{50} Study with Nutra-Spray on Pheasants. (Unpublished study received Aug 8, 1975; prepared by Harris Laboratories, Inc, submitted by Leffingwell Chemical Company, Brea, CA)

GS0649-003 McCann, J.A. (1975) Copper Oxychloride: Bluegill (Lepomis macrochirus): Static Jar Test. (U.S. Environmental Protection Agency, Technical Services Div., Chemical & Biological Investigations Branch; unpublished study).

GS0649-004 McCann, J.A. (1975) Copper Oxychloride: Rainbow Trout (Salmo gairdneri): Static Jar Test. (U.S. Environmental Protection Agency, Technical Services Div., Chemical & Biological Investigations Branch; unpublished study).

GS0649-005 McCann, J.A. (1975) Oxycop: Bluegill (Lepomis macrochirus): Static Jar Test. (U.S. Environmental Protection Agency, Technical Services Div., Chemical & Biological Investigations Branch; unpublished study).

GS0649-006 McCann, J.A. (1975) Oxycop: Rainbow Trout (Salmo gairdneri): Static Jar Test. (U.S. Environmental Protection Agency, Technical Services Div., Chemical & Biological Investigations Branch; unpublished study).

GS0649-007 U.S. Environmental Protection Agency (1984) Ambient Water Quality Criteria for Copper. (PB 85-227023; pp. 1 - 84; available from National Technical Information Service, Springfield, VA ; published study;)

APPENDIX V

FORMS APPENDICES

OMB Approval No. 2000-0468 (Expires 12-31-83)

FIFRA SECTION 3(C)(2)(B) SUMMARY SHEET	EPA REGISTRATION NO.

PRODUCT NAME

APPLICANT'S NAME	DATE GUIDANCE DOCUMENT ISSUED

With respect to the requirement to submit "generic" data imposed by the FIFRA section 3(C)(2)(B) notice contained in the referenced Guidance Document, I am responding in the following manner:

☐ 1. I will submit data in a timely manner to satisfy the following requirements. If the test procedures I will use deviate from (or are not specified in) the Registration Guidelines or the Protocols contained in the Reports of Expert Groups to the Chemicals Group, OECD Chemicals Testing Programme, I enclose the protocols that I will use:

☐ 2. I have entered into an agreement with one or more other registrants under FIFRA section 3(C)(2)(B)(ii) to satisfy the following data requirements. The tests, and any required protocols, will be submitted to EPA by:

NAME OF OTHER REGISTRANT

☐ 3. I enclose a completed "Certification of Attempt to Enter Into an Agreement with Other Registrants for Development of Data" with respect to the following data requirements:

☐ 4. I request that you amend my registration by deleting the following uses (this option is not available to applicants for new products):

☐ 5. I request voluntary cancellation of the registration of this product. (This option is not available to applicants for new products.)

REGISTRANT'S AUTHORIZED REPRESENTATIVE	SIGNATURE	DATE

EPA Form 8580-1 (10-82)

OMB Approval No. 2000-0468 (Expires: 12-31-83)

CERTIFICATION OF ATTEMPT TO ENTER INTO AN AGREEMENT WITH OTHER REGISTRANTS FOR DEVELOPMENT OF DATA

(To qualify, certify ALL four items)

1. I am duly authorized to represent the following firm(s) who are subject to the requirements of a Notice under FIFRA Section 3(c)(2)(B) contained in a Guidance Document to submit data concerning the active ingredient:

GUIDANCE DOCUMENT DATE

ACTIVE INGREDIENT

NAME OF FIRM	EPA COMPANY NUMBER

(This firm or group of firms is referred to below as "my firm".)

2. My firm is willing to develop and submit the data as required by that Notice, if necessary. However, my firm would prefer to enter into an agreement with one or more other registrants to develop jointly, or to share in the cost of developing, the following required items or data:

3. My firm has offered in writing to enter into such an agreement. Copies of the offers are attached. That offer was irrevocable and included an offer to be bound by an arbitration decision under FIFRA Section 3(c)(2)(B)(iii) if final agreement on all terms could not be reached otherwise. This offer was made to the following firm(s) on the following date(s):

NAME OF FIRM	DATE OF OFFER

However, none of those firm(s) accepted my offer.

4. My firm requests that EPA not suspend the registration(s) of my firm's product(s), if any of the firms named in paragraph (3) above have agreed to submit the data listed in paragraph (2) above in accordance with the Notice. I understand EPA will promptly inform me whether my firm must submit data to avoid suspension of its registration(s) under FIFRA Section 3(c)(2)(B). (This statement does not apply to applicants for new products.) I give EPA permission to disclose this statement upon request.

TYPED NAME	SIGNATURE	DATE

EPA Form 8580-6 (10-82)

FORMULATOR'S EXEMPTION STATEMENT
(40 CFR 152.85)

EPA File Symbol/Reg. No. ______________ Product Name ______________________

Applicant's Name and Address ______________________________________

____

____

____

As an authorized representative of the applicant for registration of the product identified above, I hereby certify that:

(1) This product contains the active ingredient(s): ________________

____

____

(2) Each active ingredient listed in paragraph (1) is present solely as the result of the incorporation into the product (during formulation or packaging) of another product which contains that active ingredient, which is registered under FIFRA sec. 3, and which is purchased by us from another producer.

(3) Indicate by circling (A) or (B) below which paragraph applies:

(A) An accurate Confidential Statement of Formula (EPA Form 8570-4) for the above identified product is attached to this statement. That formula statement indicates, by company name, registration number and product name, the source of the active ingredient(s) listed in paragraph (1).

OR

(B) The Confidential Statement of Formula dated __________ on file with the EPA is complete, current and accurate and contains the information required on the current CSF Form No. 8570-4. The registered source(s) of the active ingredient(s) listed in paragraph (1) is/are listed below:

Active ingredient	Source: Product name and Reg. No.

Signature ______________________________

Date ______________ Title ______________________________

EPA Form (April 1985)

☆U.S. GOVERNMENT PRINTING OFFICE: 1987-716-002/60599